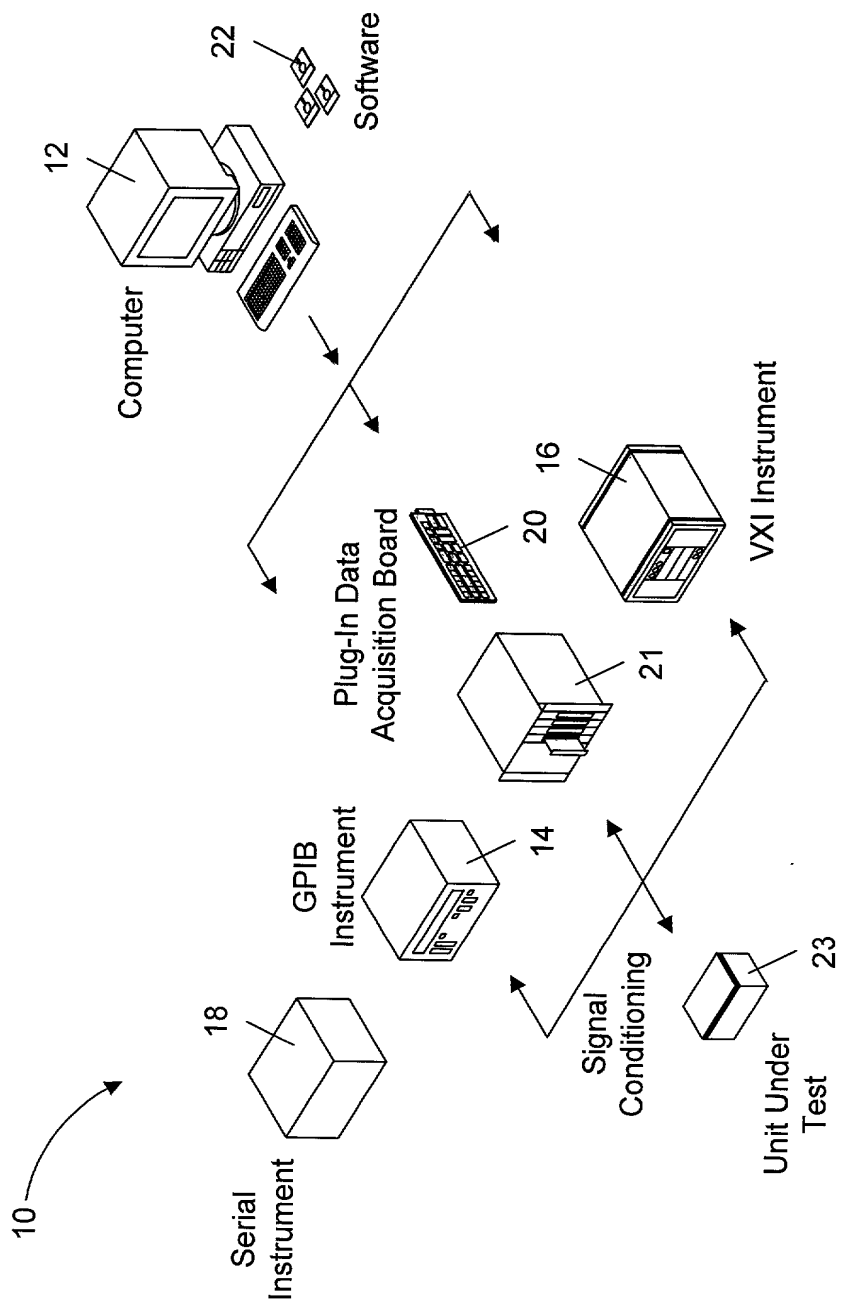
10
Serial Instrument
18
GPIB Instrument
14
Plug-In Data Acquisition Board
21
20
Signal Conditioning
Unit Under Test
23
VXI Instrument
16
Computer
12
Software
22

FIG. 1

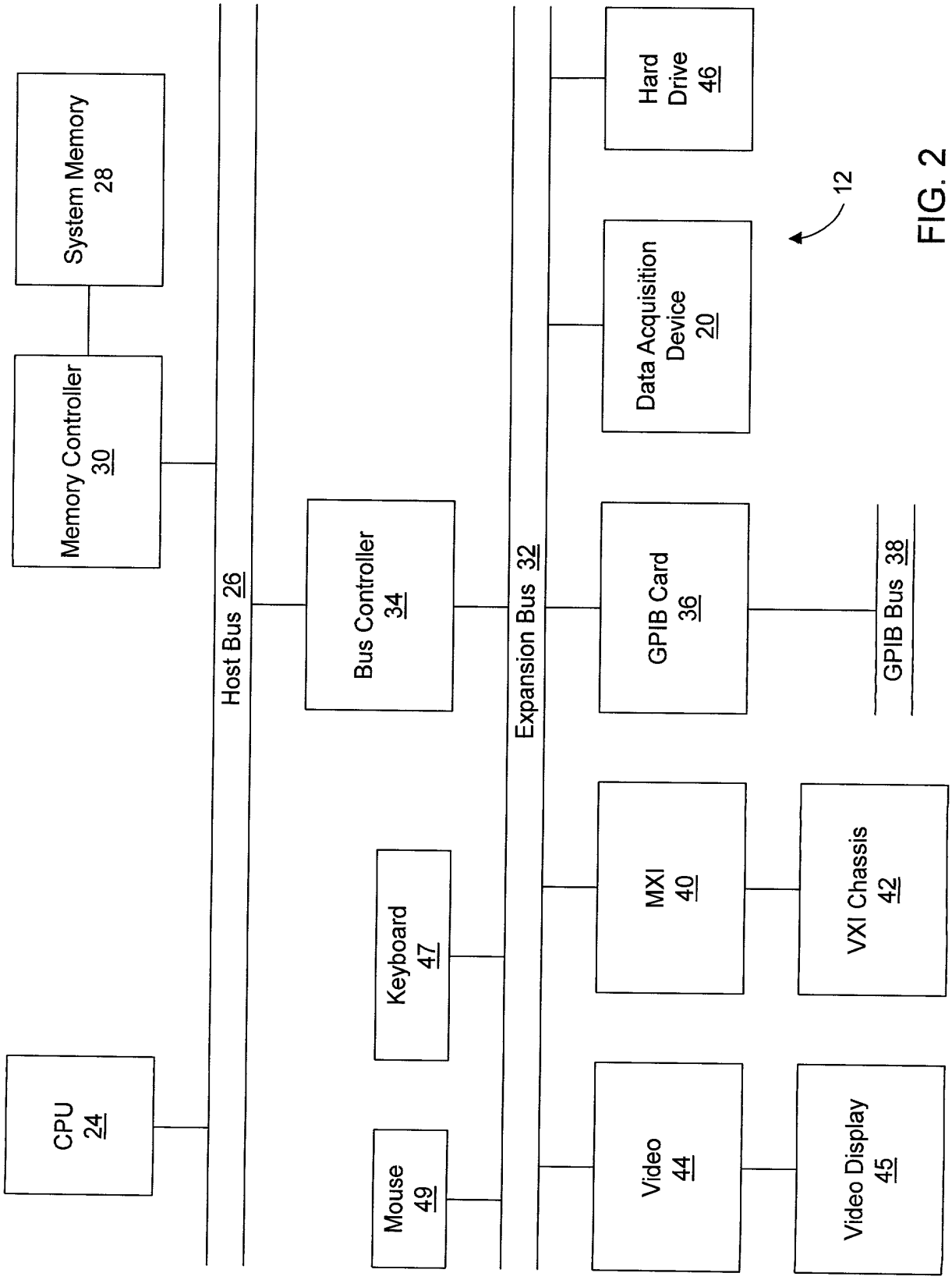
CPU 24
Host Bus 26
System Memory 28
Memory Controller 30
Bus Controller 34
Expansion Bus 32
Keyboard 47
Mouse 49
Hard Drive 46
Data Acquisition Device 20
12
GPIB Card 36
GPIB Bus 38
MXI 40
VXI Chassis 42
Video 44
Video Display 45

FIG. 2

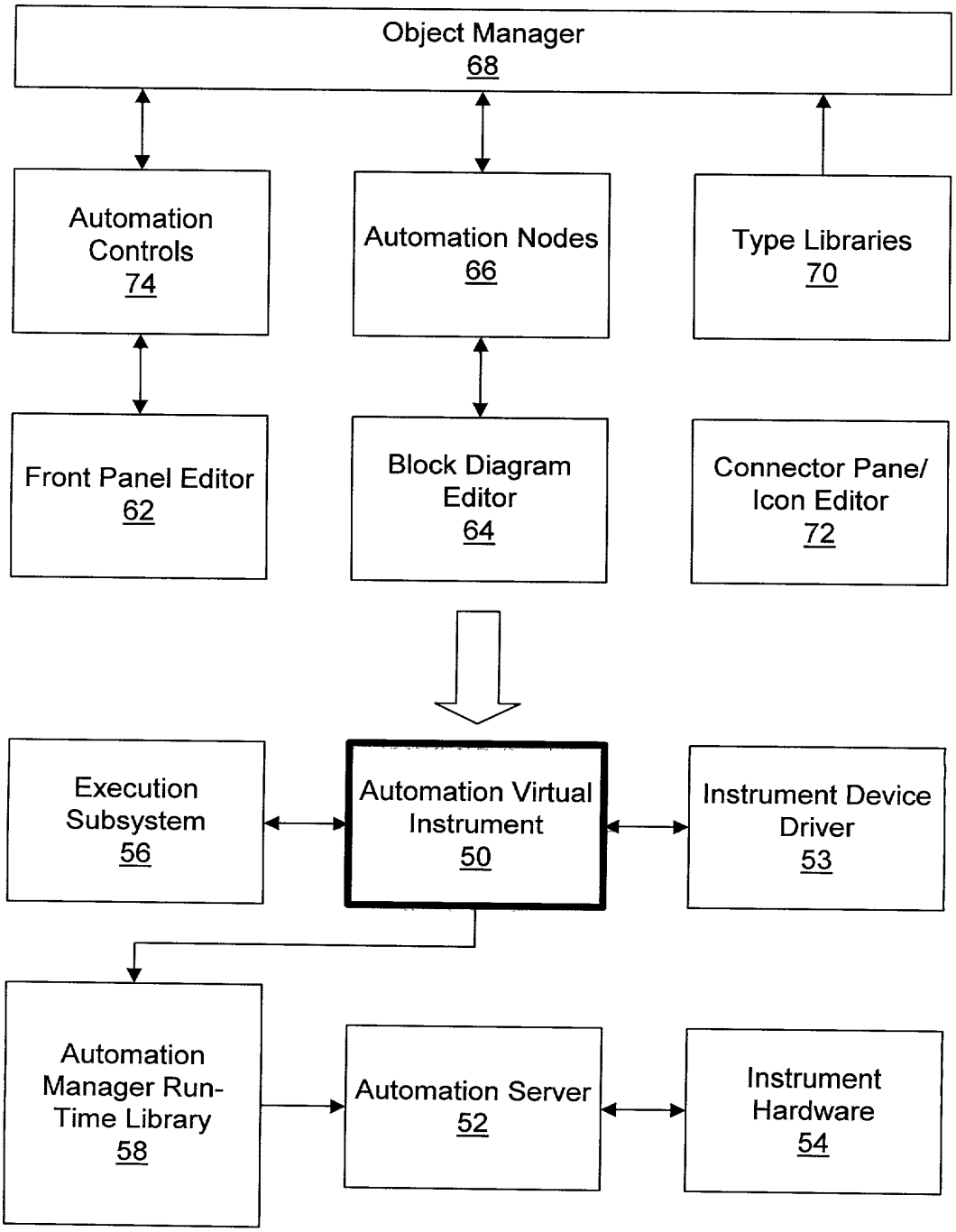
Object Manager
68
Automation Controls
74
Automation Nodes
66
Type Libraries
70
Front Panel Editor
62
Block Diagram Editor
64
Connector Pane/ Icon Editor
72
Execution Subsystem
56
Automation Virtual Instrument
50
Instrument Device Driver
53
Automation Manager Run-Time Library
58
Automation Server
52
Instrument Hardware
54

FIG. 3

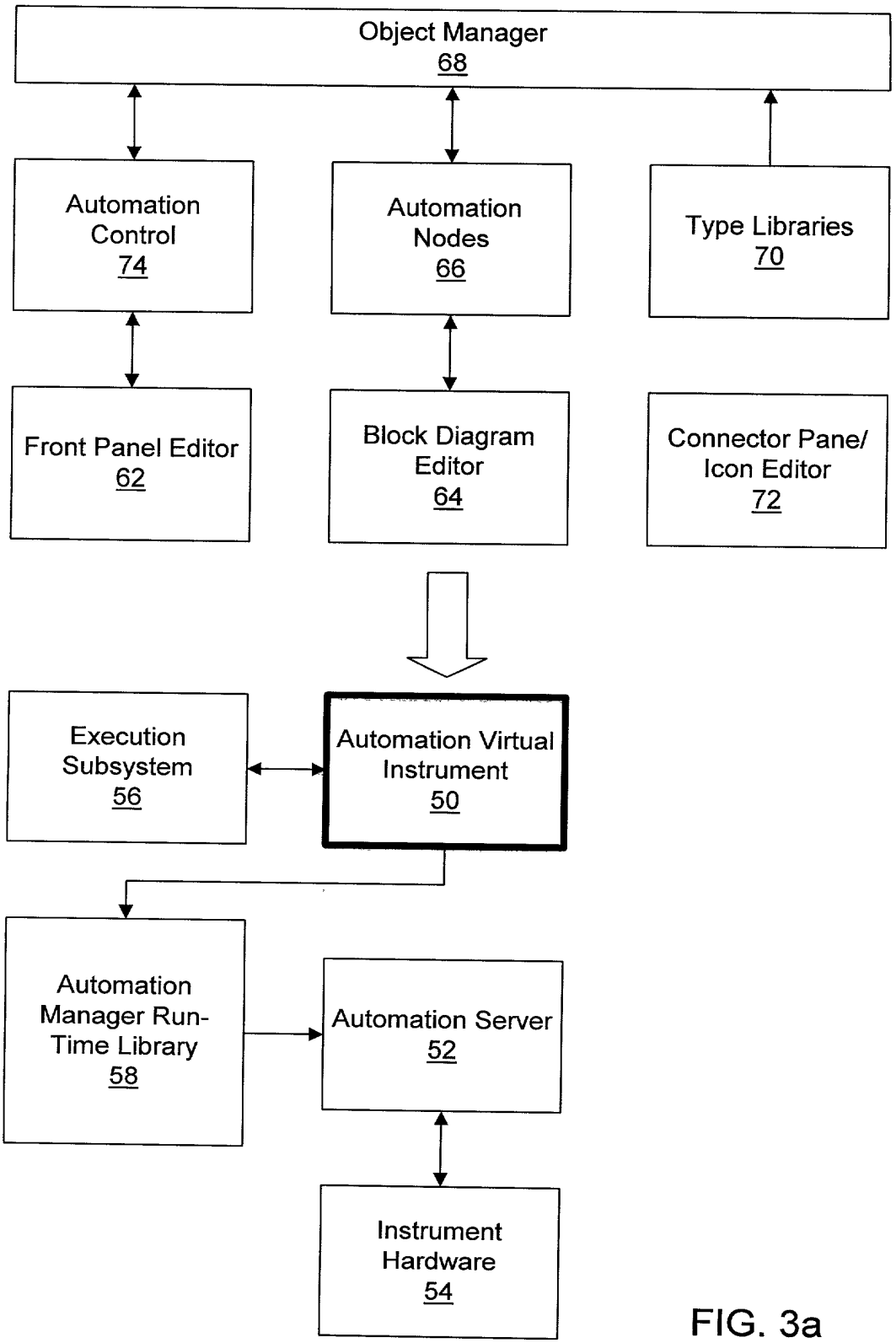
Object Manager
68
Automation Control
74
Automation Nodes
66
Type Libraries
70
Front Panel Editor
62
Block Diagram Editor
64
Connector Pane/ Icon Editor
72
Execution Subsystem
56
Automation Virtual Instrument
50
Automation Manager Run-Time Library
58
Automation Server
52
Instrument Hardware
54

FIG. 3a

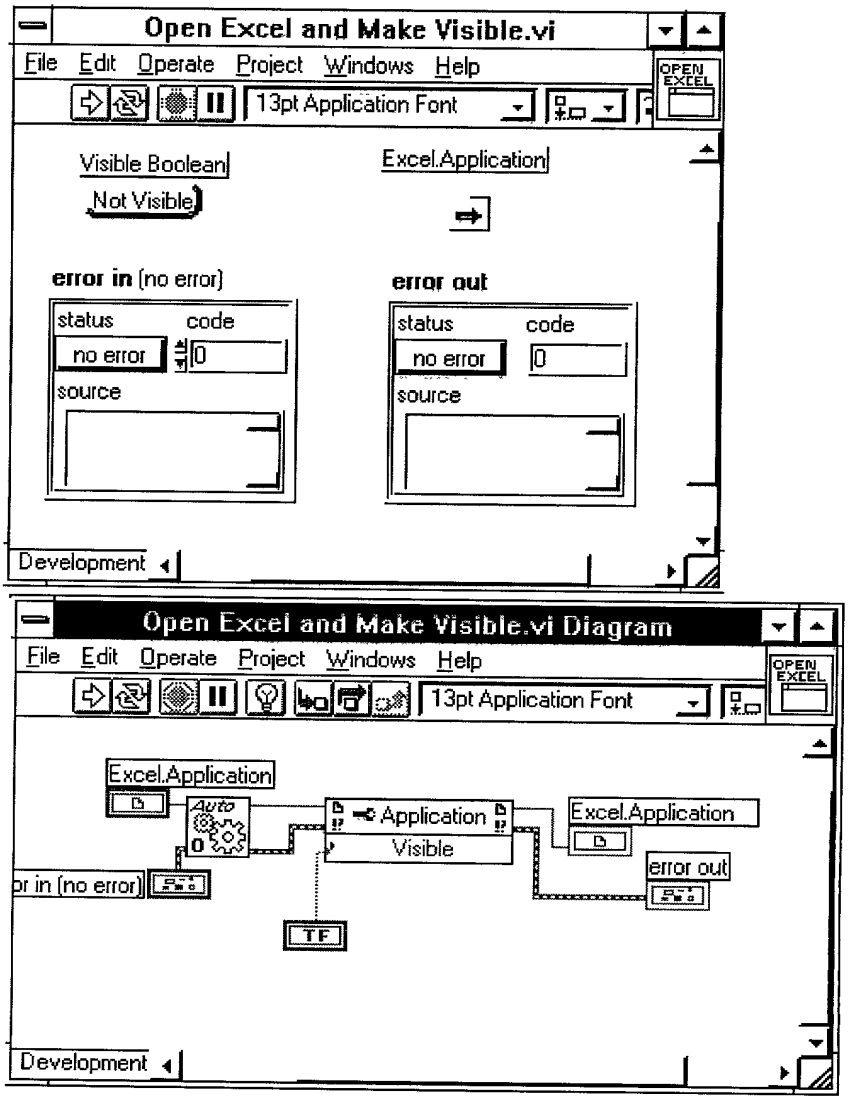
Open Excel and Make Visible.vi
File Edit Operate Project Windows Help
13pt Application Font
OPEN EXCEL
Visible Boolean
Not Visible
Excel.Application
error in (no error)
status
code
no error
0
source
error out
status
code
no error
0
source
Development
Open Excel and Make Visible.vi Diagram
File Edit Operate Project Windows Help
13pt Application Font
OPEN EXCEL
Excel.Application
Auto
0
Application
Visible
Excel.Application
error out
or in (no error)
TF
Development

FIG. 4

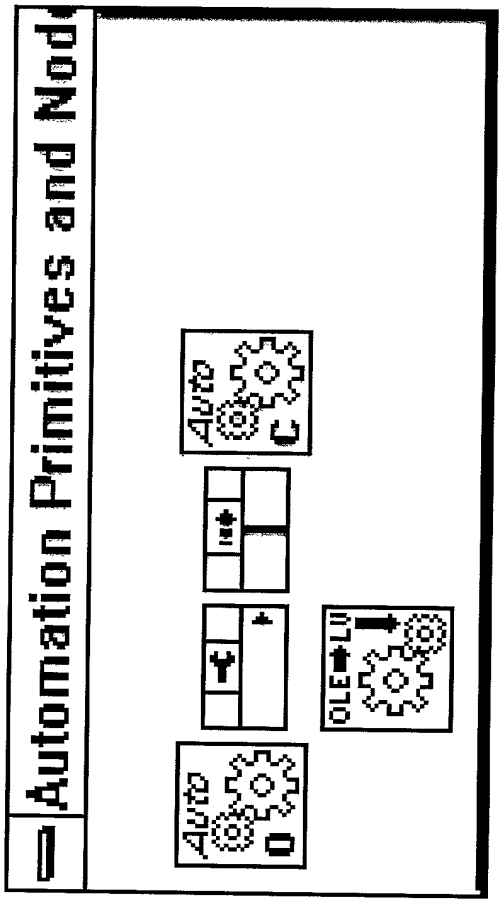

FIG. 5

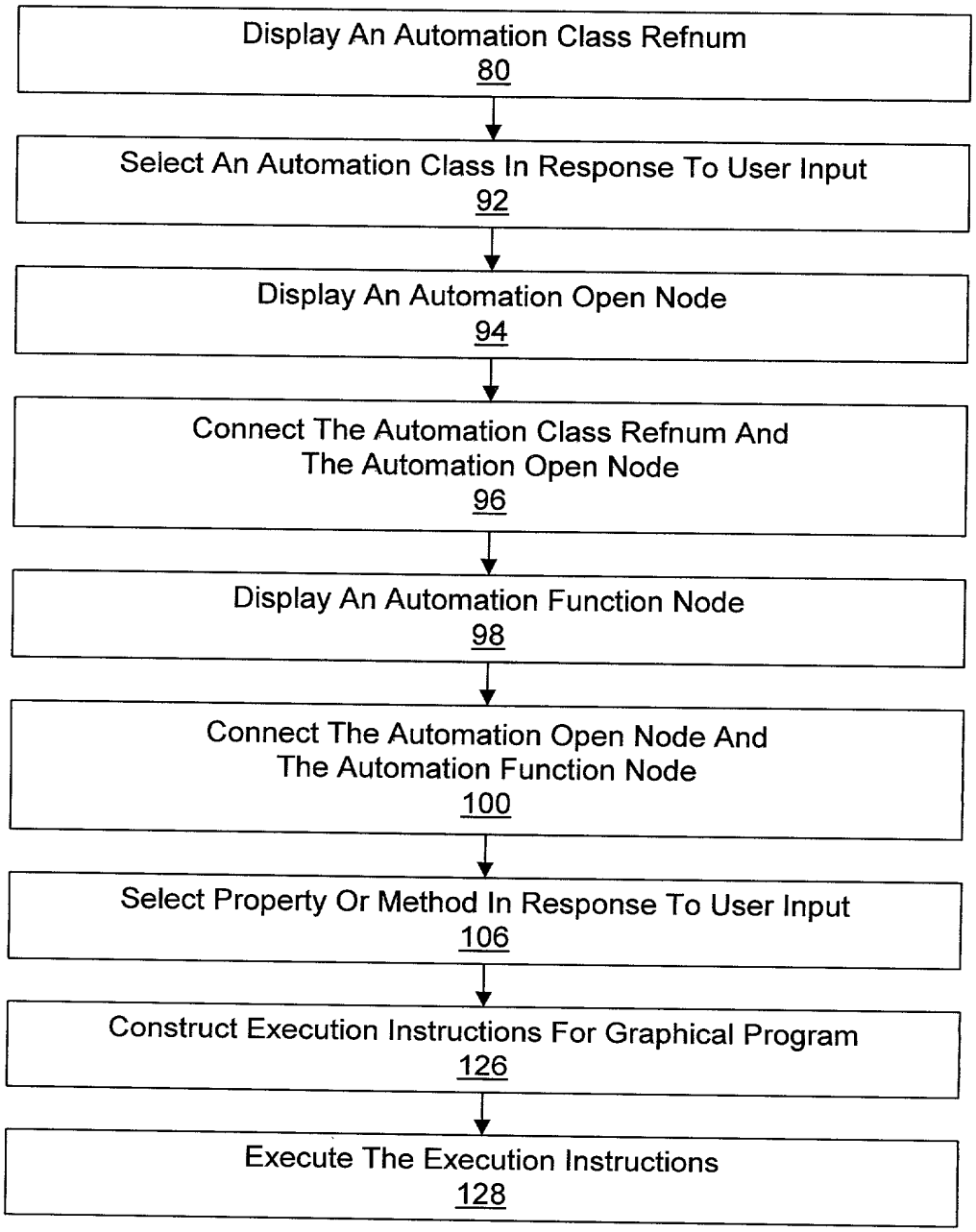
Display An Automation Class Refnum
80
Select An Automation Class In Response To User Input
92
Display An Automation Open Node
94
Connect The Automation Class Refnum And
The Automation Open Node
96
Display An Automation Function Node
98
Connect The Automation Open Node And
The Automation Function Node
100
Select Property Or Method In Response To User Input
106
Construct Execution Instructions For Graphical Program
126
Execute The Execution Instructions
128

FIG. 6

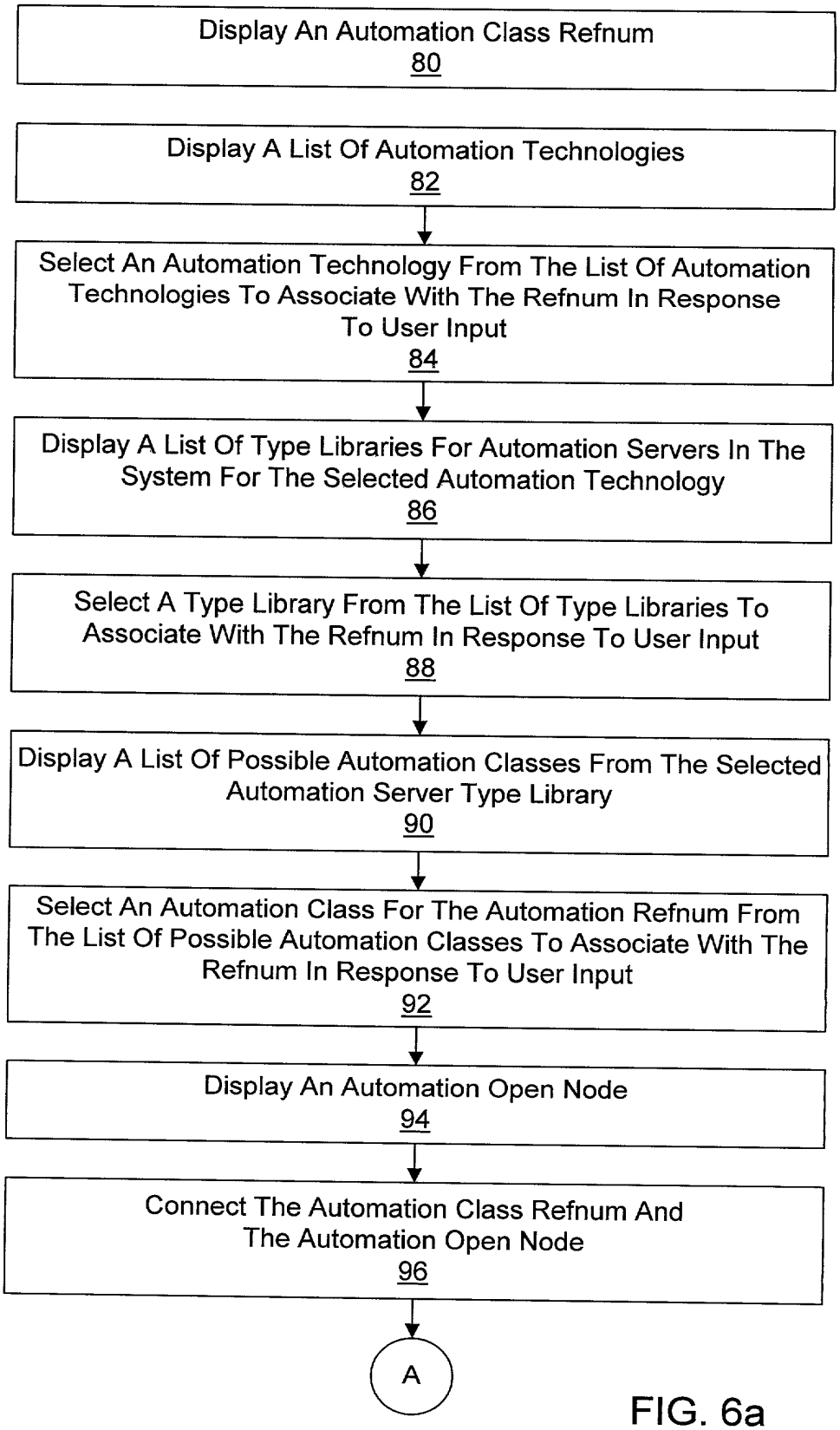
Display An Automation Class Refnum
80
Display A List Of Automation Technologies
82
Select An Automation Technology From The List Of Automation Technologies To Associate With The Refnum In Response To User Input
84
Display A List Of Type Libraries For Automation Servers In The System For The Selected Automation Technology
86
Select A Type Library From The List Of Type Libraries To Associate With The Refnum In Response To User Input
88
Display A List Of Possible Automation Classes From The Selected Automation Server Type Library
90
Select An Automation Class For The Automation Refnum From The List Of Possible Automation Classes To Associate With The Refnum In Response To User Input
92
Display An Automation Open Node
94
Connect The Automation Class Refnum And The Automation Open Node
96
A

FIG. 6a

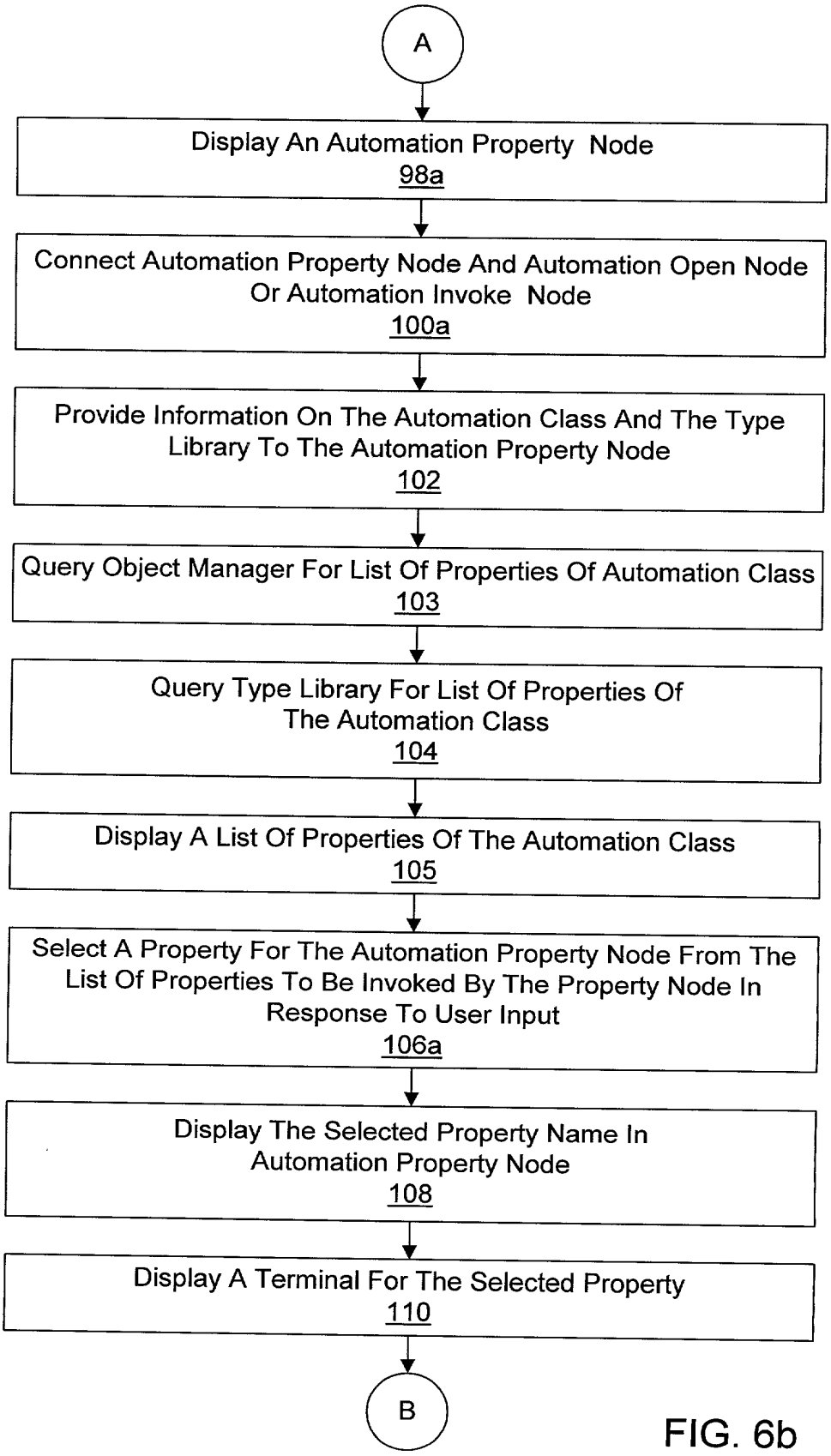
A
Display An Automation Property Node
98a
Connect Automation Property Node And Automation Open Node Or Automation Invoke Node
100a
Provide Information On The Automation Class And The Type Library To The Automation Property Node
102
Query Object Manager For List Of Properties Of Automation Class
103
Query Type Library For List Of Properties Of The Automation Class
104
Display A List Of Properties Of The Automation Class
105
Select A Property For The Automation Property Node From The List Of Properties To Be Invoked By The Property Node In Response To User Input
106a
Display The Selected Property Name In Automation Property Node
108
Display A Terminal For The Selected Property
110
B

FIG. 6b

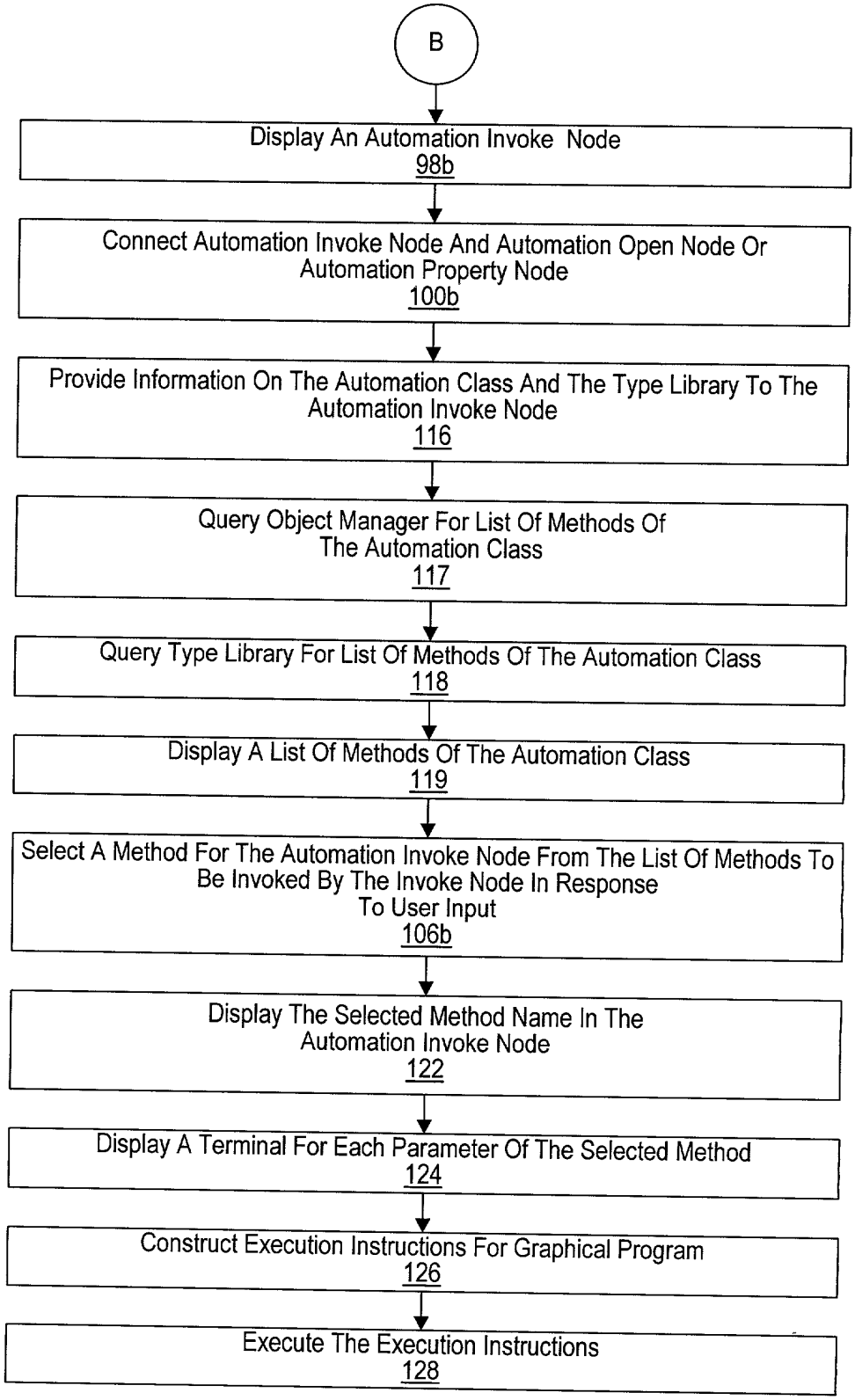
B
Display An Automation Invoke Node
98b
Connect Automation Invoke Node And Automation Open Node Or Automation Property Node
100b
Provide Information On The Automation Class And The Type Library To The Automation Invoke Node
116
Query Object Manager For List Of Methods Of The Automation Class
117
Query Type Library For List Of Methods Of The Automation Class
118
Display A List Of Methods Of The Automation Class
119
Select A Method For The Automation Invoke Node From The List Of Methods To Be Invoked By The Invoke Node In Response To User Input
106b
Display The Selected Method Name In The Automation Invoke Node
122
Display A Terminal For Each Parameter Of The Selected Method
124
Construct Execution Instructions For Graphical Program
126
Execute The Execution Instructions
128

FIG. 6c

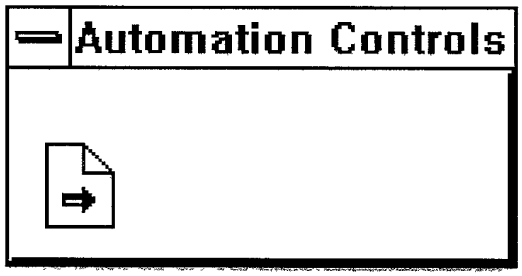
Automation Controls

FIG. 7

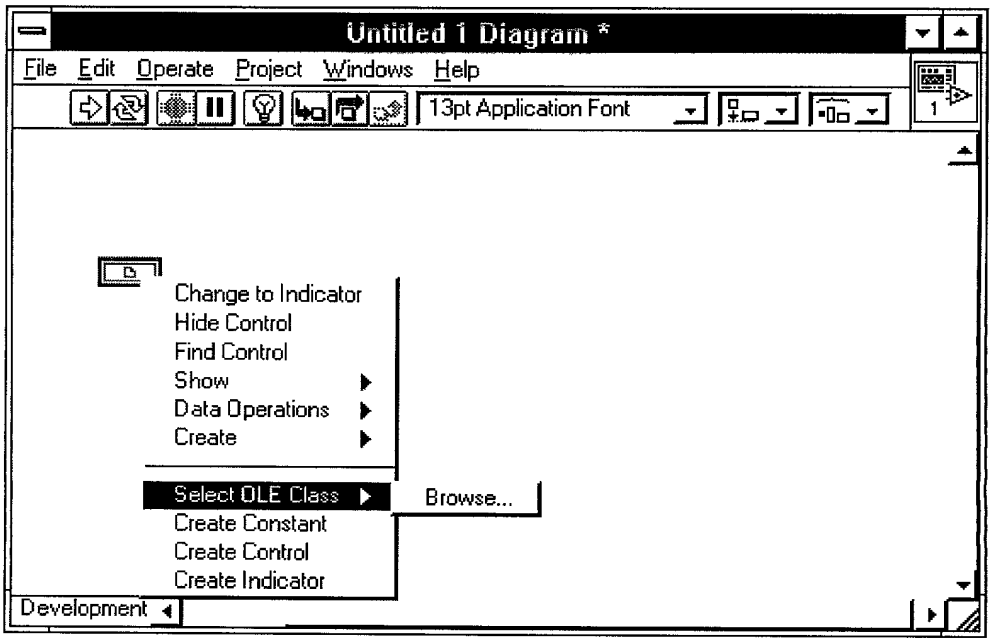
Untitled 1 Diagram *
File Edit Operate Project Windows Help
13pt Application Font
Change to Indicator
Hide Control
Find Control
Show
Data Operations
Create
Select OLE Class
Browse...
Create Constant
Create Control
Create Indicator
Development

FIG. 8

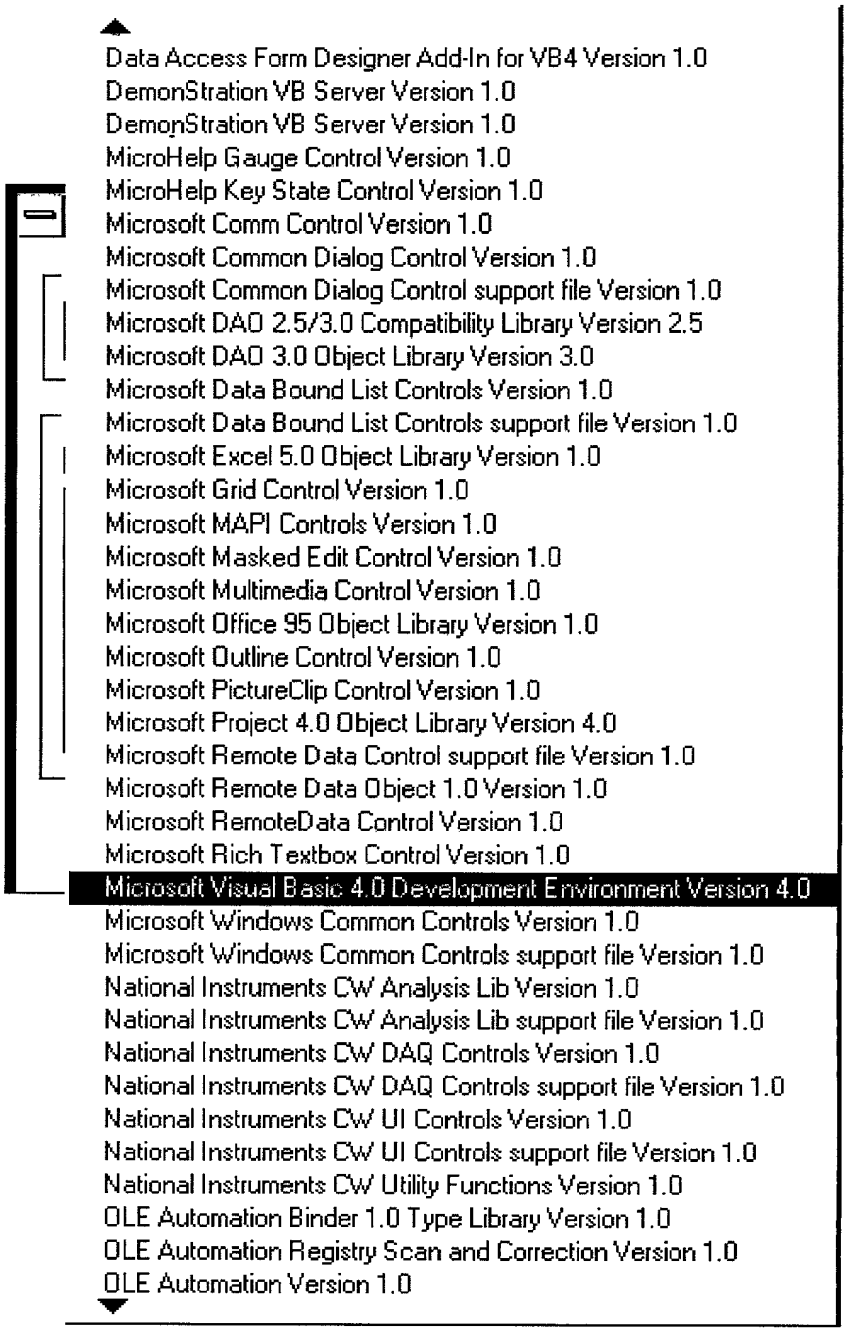
Data Access Form Designer Add-In for VB4 Version 1.0
DemonStration VB Server Version 1.0
DemonStration VB Server Version 1.0
MicroHelp Gauge Control Version 1.0
MicroHelp Key State Control Version 1.0
Microsoft Comm Control Version 1.0
Microsoft Common Dialog Control Version 1.0
Microsoft Common Dialog Control support file Version 1.0
Microsoft DAO 2.5/3.0 Compatibility Library Version 2.5
Microsoft DAO 3.0 Object Library Version 3.0
Microsoft Data Bound List Controls Version 1.0
Microsoft Data Bound List Controls support file Version 1.0
Microsoft Excel 5.0 Object Library Version 1.0
Microsoft Grid Control Version 1.0
Microsoft MAPI Controls Version 1.0
Microsoft Masked Edit Control Version 1.0
Microsoft Multimedia Control Version 1.0
Microsoft Office 95 Object Library Version 1.0
Microsoft Outline Control Version 1.0
Microsoft PictureClip Control Version 1.0
Microsoft Project 4.0 Object Library Version 4.0
Microsoft Remote Data Control support file Version 1.0
Microsoft Remote Data Object 1.0 Version 1.0
Microsoft RemoteData Control Version 1.0
Microsoft Rich Textbox Control Version 1.0
Microsoft Visual Basic 4.0 Development Environment Version 4.0
Microsoft Windows Common Controls Version 1.0
Microsoft Windows Common Controls support file Version 1.0
National Instruments CW Analysis Lib Version 1.0
National Instruments CW Analysis Lib support file Version 1.0
National Instruments CW DAQ Controls Version 1.0
National Instruments CW DAQ Controls support file Version 1.0
National Instruments CW UI Controls Version 1.0
National Instruments CW UI Controls support file Version 1.0
National Instruments CW Utility Functions Version 1.0
OLE Automation Binder 1.0 Type Library Version 1.0
OLE Automation Registry Scan and Correction Version 1.0
OLE Automation Version 1.0

FIG. 9

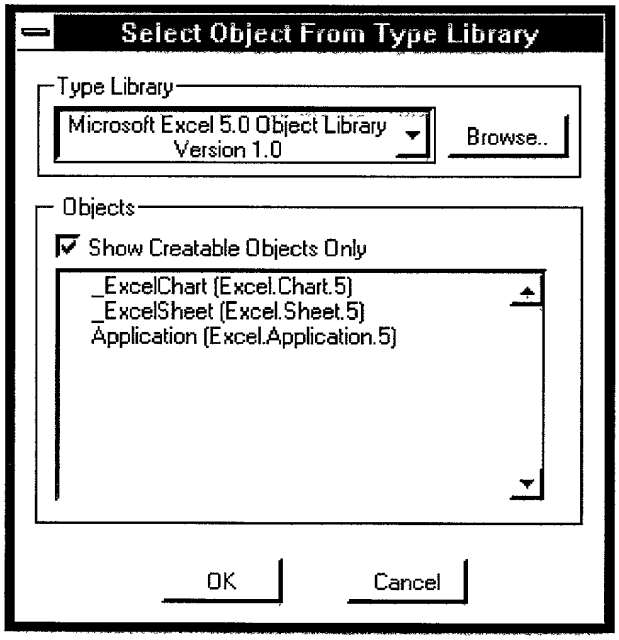
Select Object From Type Library
Type Library
Microsoft Excel 5.0 Object Library
Version 1.0
Browse..
Objects
Show Creatable Objects Only
_ExcelChart (Excel.Chart.5)
_ExcelSheet (Excel.Sheet.5)
Application (Excel.Application.5)
OK
Cancel

FIG. 10

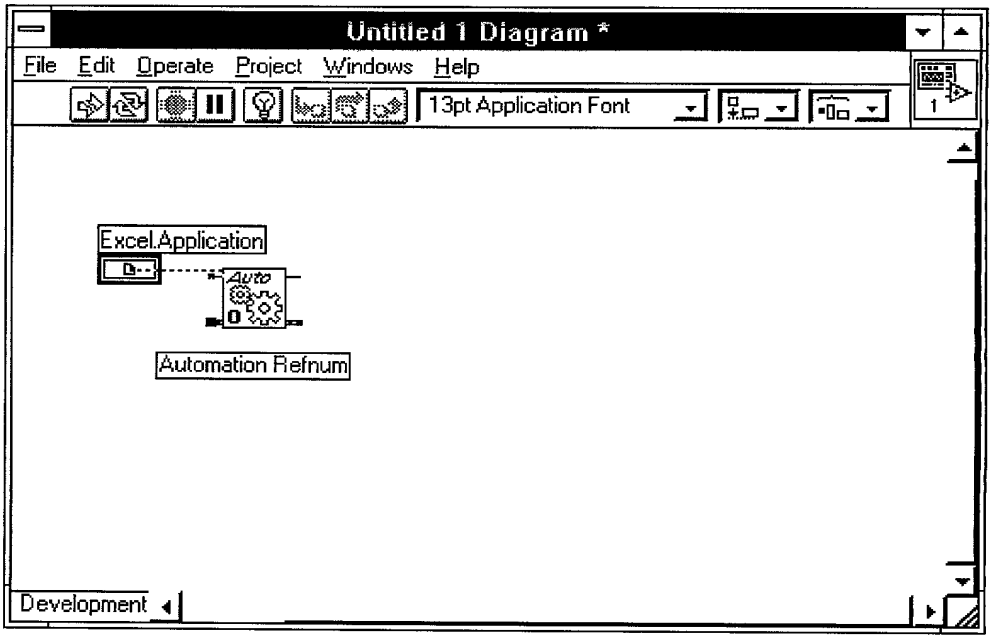
Untitled 1 Diagram *
File Edit Operate Project Windows Help
13pt Application Font
Excel.Application
Automation Refnum
Development

FIG. 11

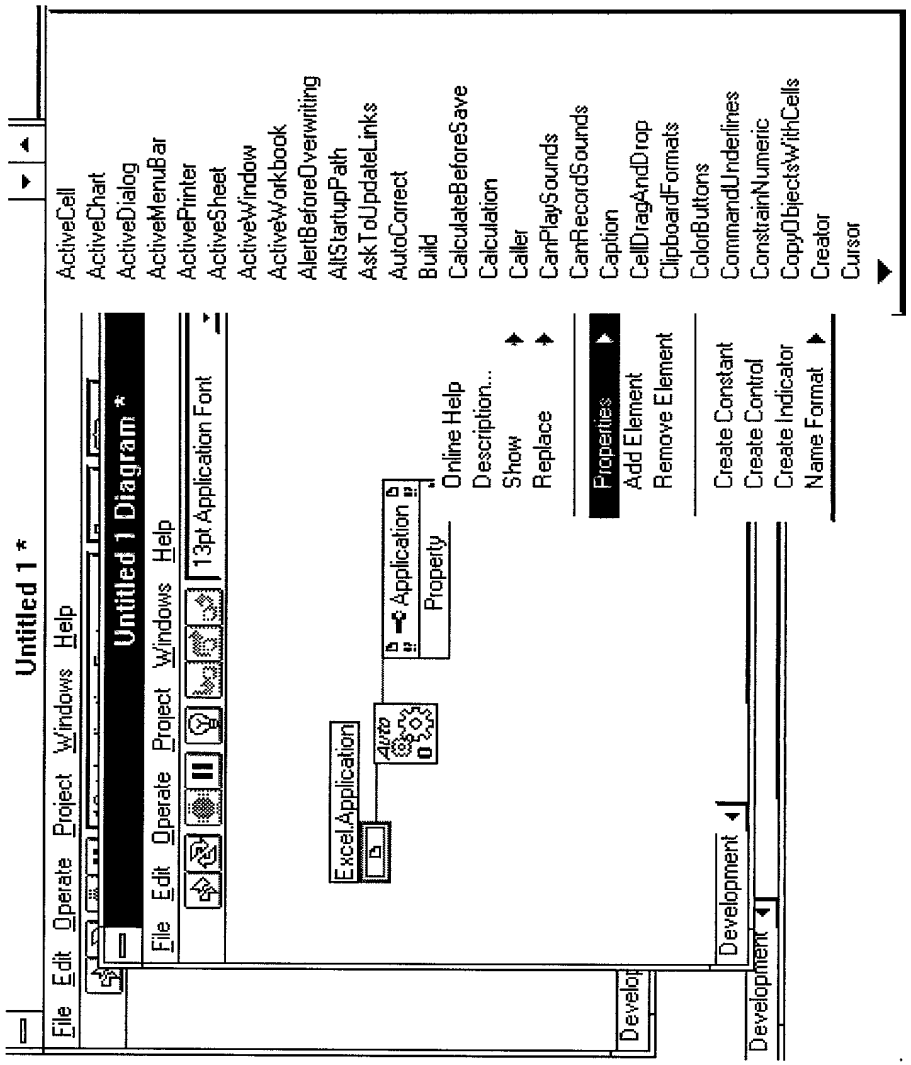
Untitled 1 *
File Edit Operate Project Windows Help
Untitled 1 Diagram *
File Edit Operate Project Windows Help
13pt Application Font
Excel.Application
Application
Property
Online Help
Description...
Show
Replace
Properties
Add Element
Remove Element
Create Constant
Create Control
Create Indicator
Name Format
Development
ActiveCell
ActiveChart
ActiveDialog
ActiveMenuBar
ActivePrinter
ActiveSheet
ActiveWindow
ActiveWorkbook
AlertBeforeOverwriting
AltStartupPath
AskToUpdateLinks
AutoCorrect
Build
CalculateBeforeSave
Calculation
Caller
CanPlaySounds
CanRecordSounds
Caption
CellDragAndDrop
ClipboardFormats
ColorButtons
CommandUnderlines
ConstrainNumeric
CopyObjectsWithCells
Creator
Cursor

FIG. 12

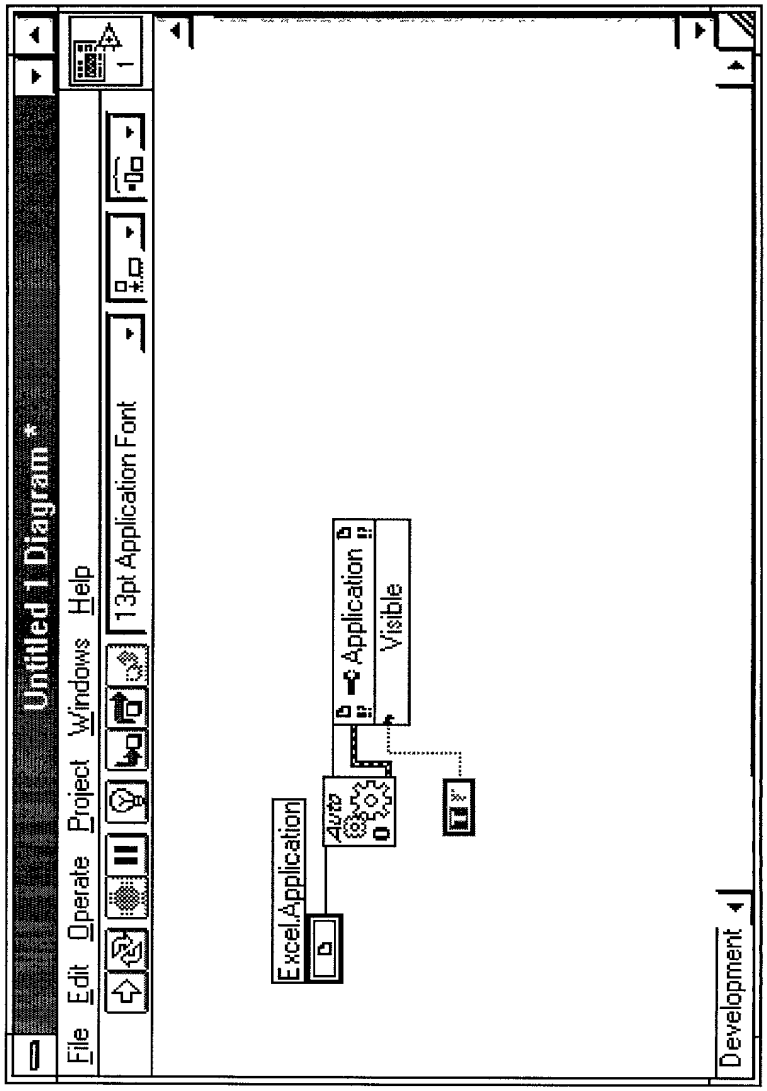
Untitled 1 Diagram *
File Edit Operate Project Windows Help
13pt Application Font
Excel.Application
Application
Visible
Development

FIG. 13

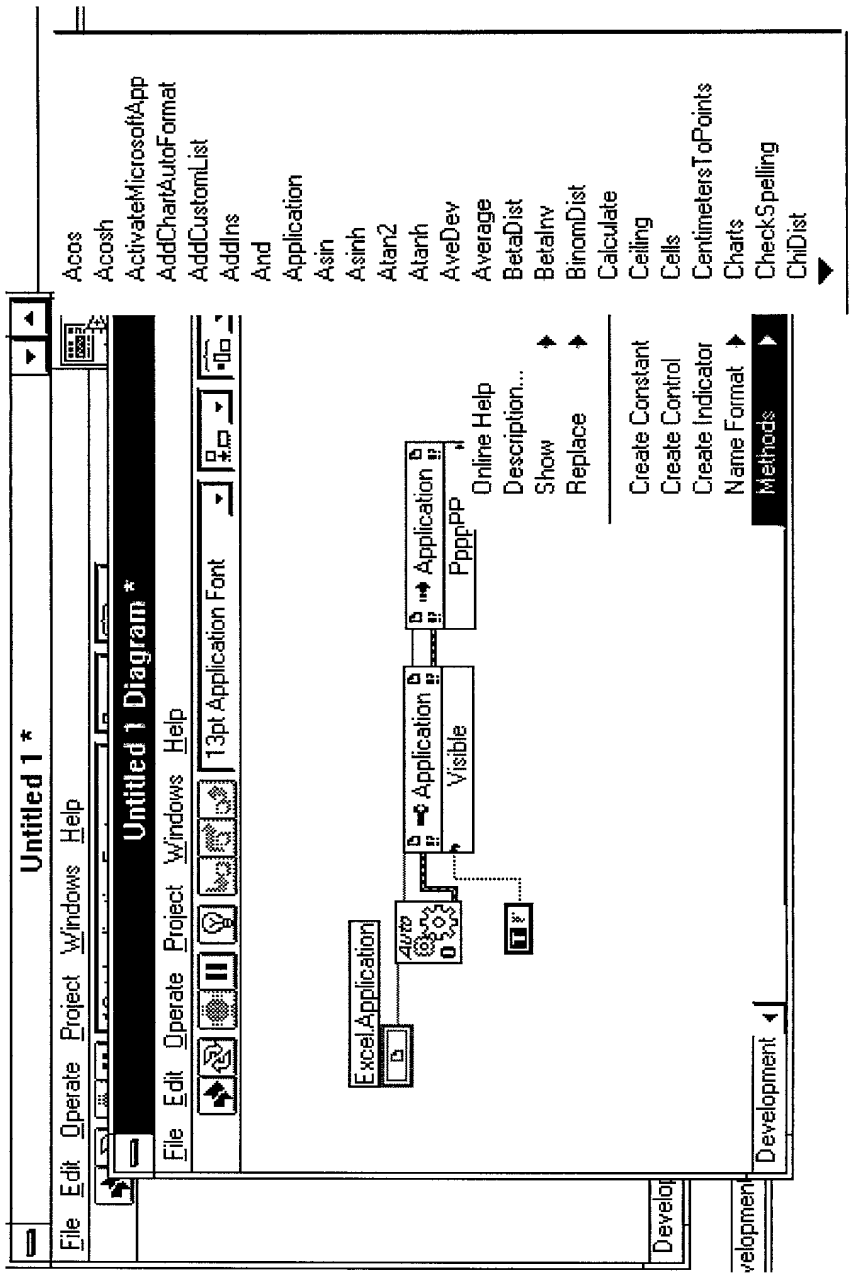
Untitled 1 *
File Edit Operate Project Windows Help
Untitled 1 Diagram *
File Edit Operate Project Windows Help
13pt Application Font
Excel.Application
Application
Visible
Application
PppPP
Online Help
Description...
Show
Replace
Create Constant
Create Control
Create Indicator
Name Format
Methods
Development
Acos
Acosh
ActivateMicrosoftApp
AddChartAutoFormat
AddCustomList
AddIns
And
Application
Asin
Asinh
Atan2
Atanh
AveDev
Average
BetaDist
BetaInv
BinomDist
Calculate
Ceiling
Cells
CentimetersToPoints
Charts
CheckSpelling
ChiDist

FIG. 14

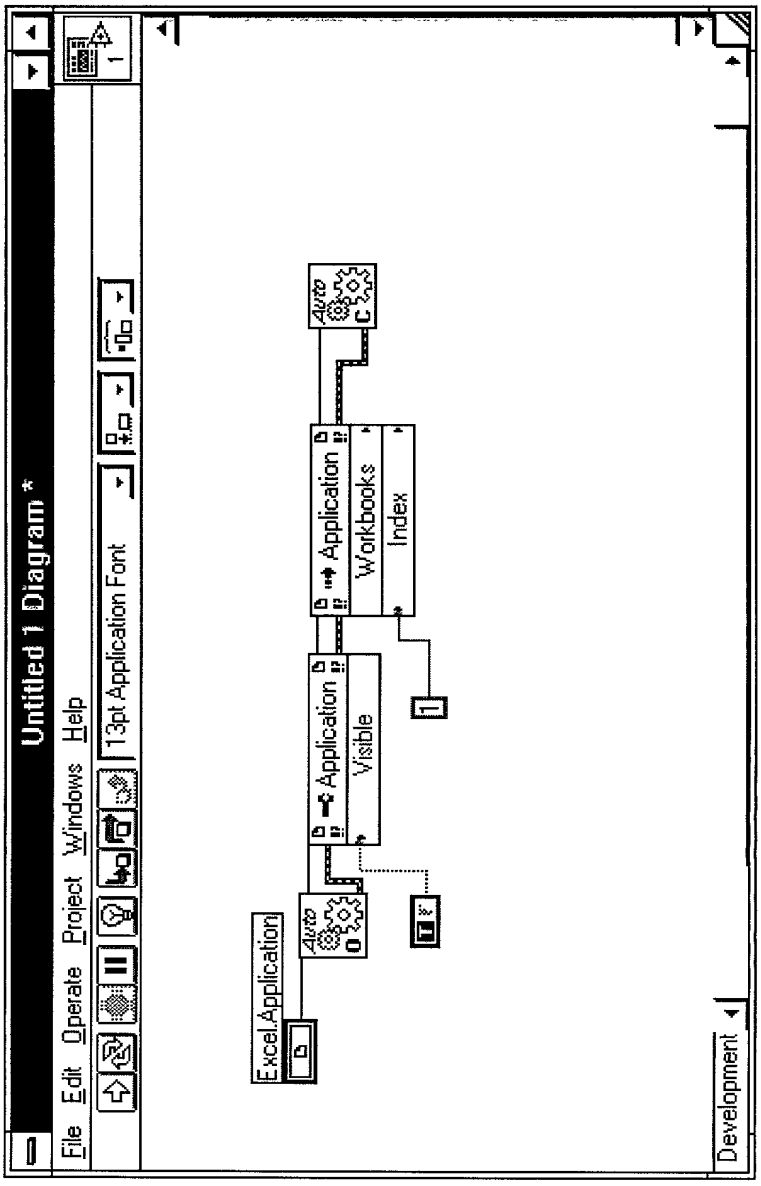
Untitled 1 Diagram *
File Edit Operate Project Windows Help
13pt Application Font
Excel.Application
Auto
Application
Visible
Application
Workbooks
Index
Auto
1
Development

FIG. 15

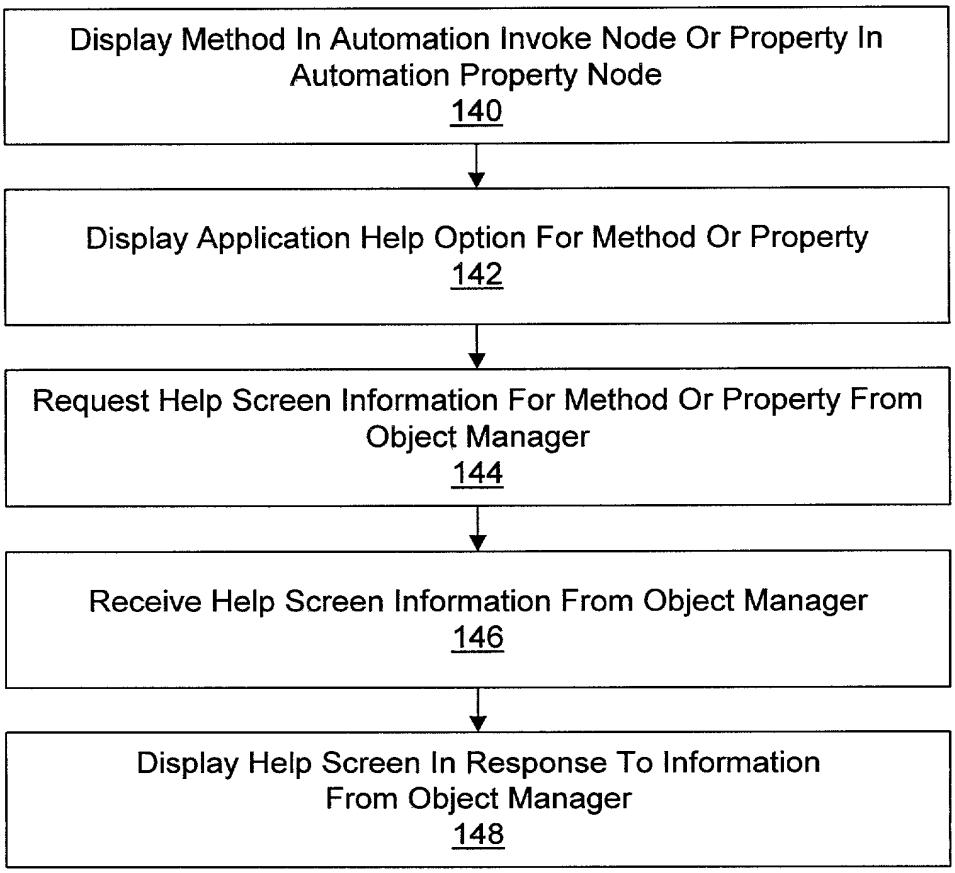
Display Method In Automation Invoke Node Or Property In Automation Property Node
140
Display Application Help Option For Method Or Property
142
Request Help Screen Information For Method Or Property From Object Manager
144
Receive Help Screen Information From Object Manager
146
Display Help Screen In Response To Information From Object Manager
148

FIG. 16

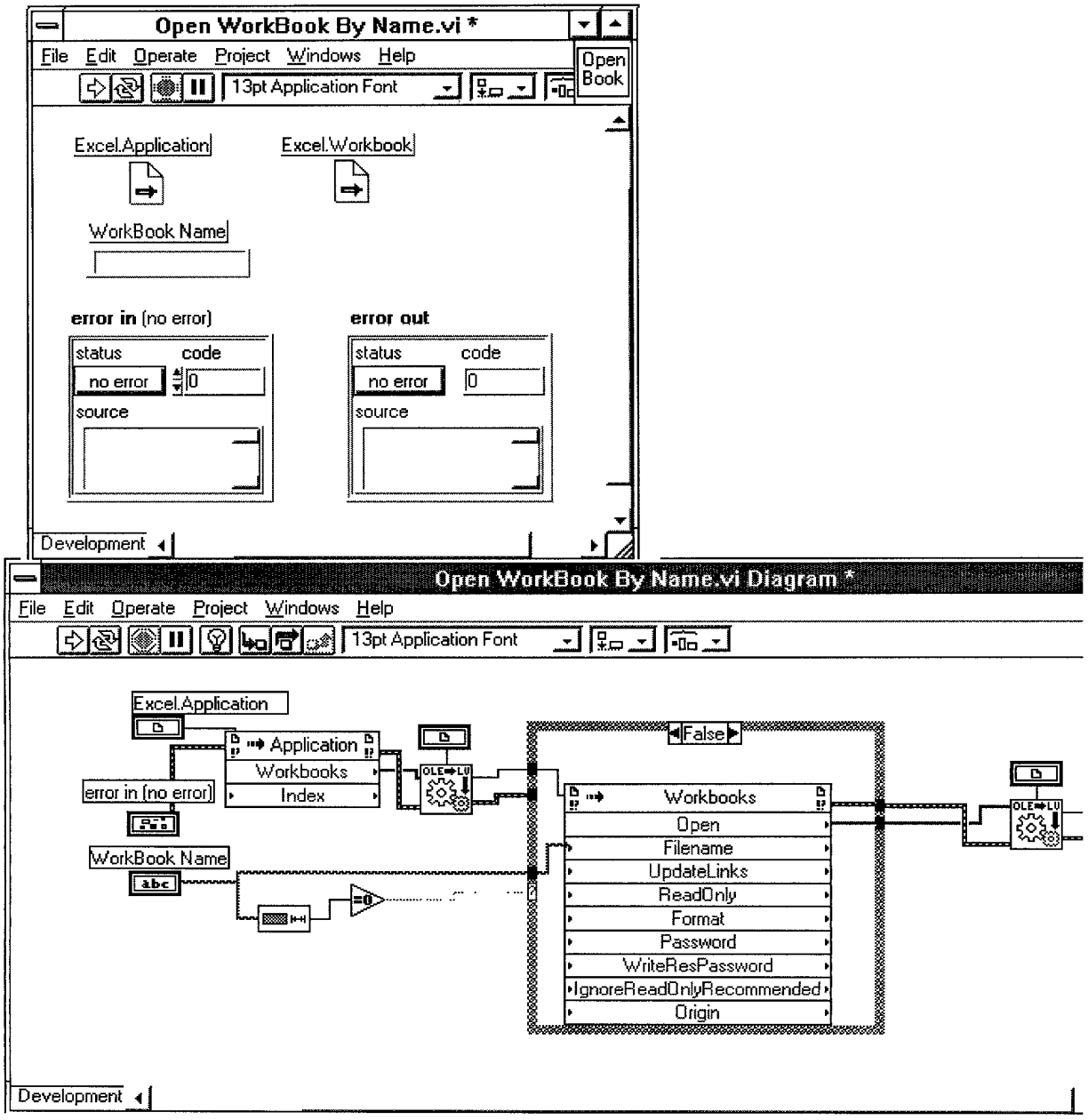
Open WorkBook By Name.vi *
File Edit Operate Project Windows Help
13pt Application Font
Open Book
Excel.Application
Excel.Workbook
WorkBook Name
error in (no error)
status
code
no error
0
source
error out
status
code
no error
0
source
Development
Open WorkBook By Name.vi Diagram *
File Edit Operate Project Windows Help
13pt Application Font
Excel.Application
Application
Workbooks
Index
error in (no error)
WorkBook Name
abc
False
Workbooks
Open
Filename
UpdateLinks
ReadOnly
Format
Password
WriteResPassword
IgnoreReadOnlyRecommended
Origin
Development

FIG. 17

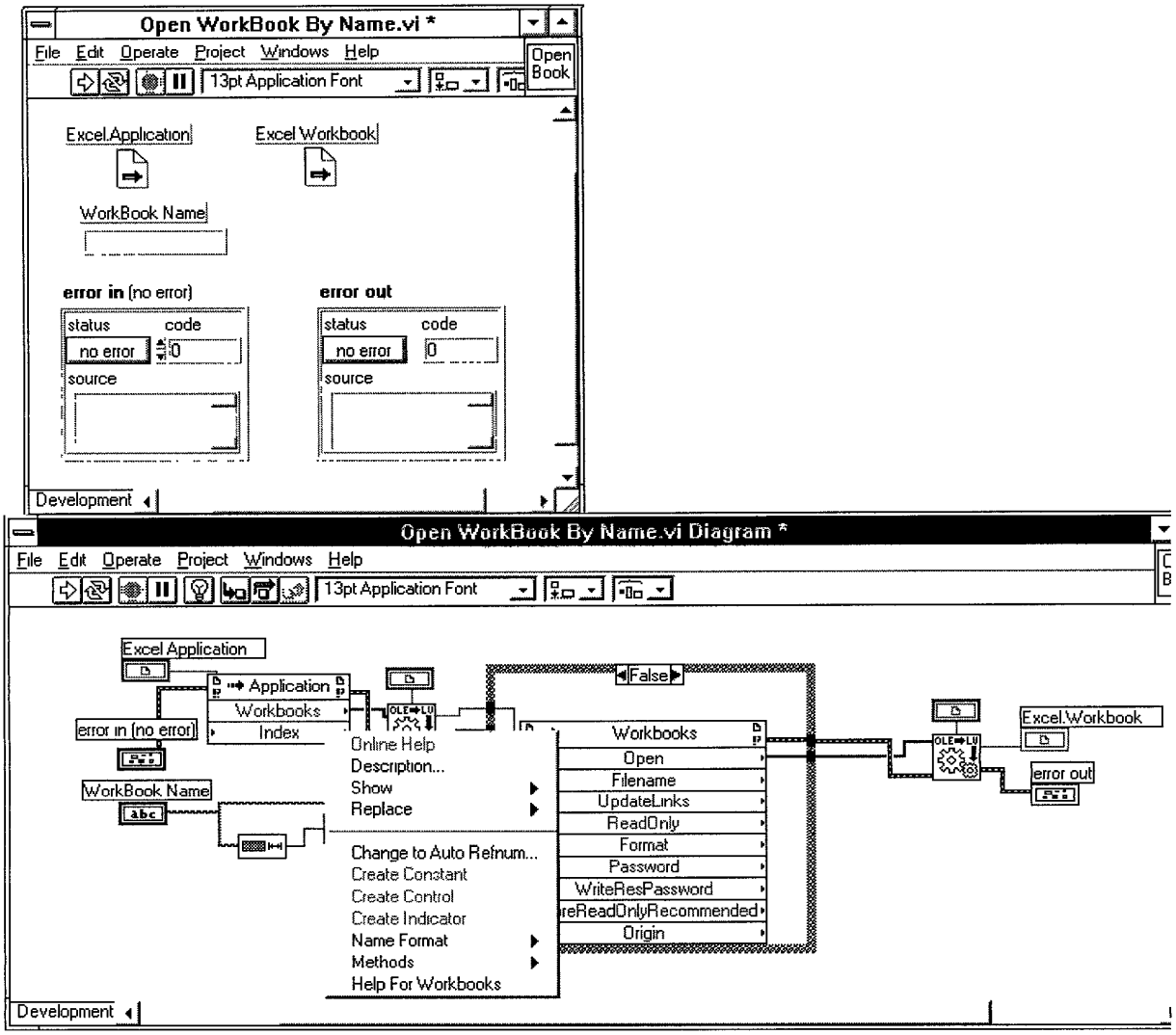
Open WorkBook By Name.vi *
File Edit Operate Project Windows Help
13pt Application Font
Open Book
Excel.Application
Excel Workbook
WorkBook Name
error in (no error)
status
code
no error
0
source
error out
Development
Open WorkBook By Name.vi Diagram *
Excel Application
Application
Workbooks
Index
error in (no error)
WorkBook Name
Online Help
Description...
Show
Replace
Change to Auto Refnum...
Create Constant
Create Control
Create Indicator
Name Format
Methods
Help For Workbooks
False
Workbooks
Open
Filename
UpdateLinks
ReadOnly
Format
Password
WriteResPassword
Origin
Excel.Workbook
error out

FIG. 18

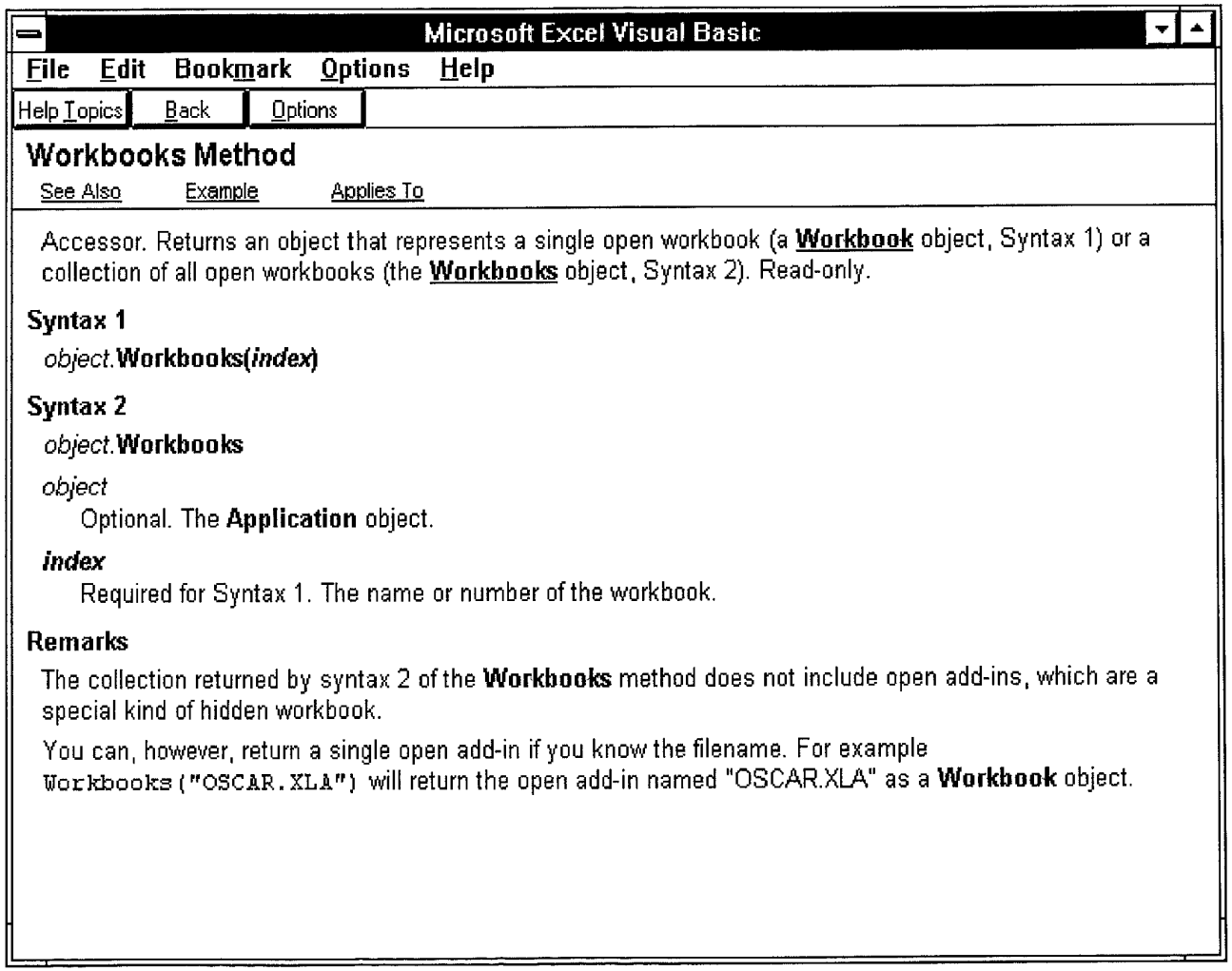
Microsoft Excel Visual Basic
File Edit Bookmark Options Help
Help Topics Back Options
Workbooks Method
See Also Example Applies To
Accessor. Returns an object that represents a single open workbook (a Workbook object, Syntax 1) or a collection of all open workbooks (the Workbooks object, Syntax 2). Read-only.
Syntax 1
object.Workbooks(index)
Syntax 2
object.Workbooks
object
Optional. The Application object.
index
Required for Syntax 1. The name or number of the workbook.
Remarks
The collection returned by syntax 2 of the Workbooks method does not include open add-ins, which are a special kind of hidden workbook.
You can, however, return a single open add-in if you know the filename. For example
Workbooks("OSCAR.XLA") will return the open add-in named "OSCAR.XLA" as a Workbook object.

FIG. 19

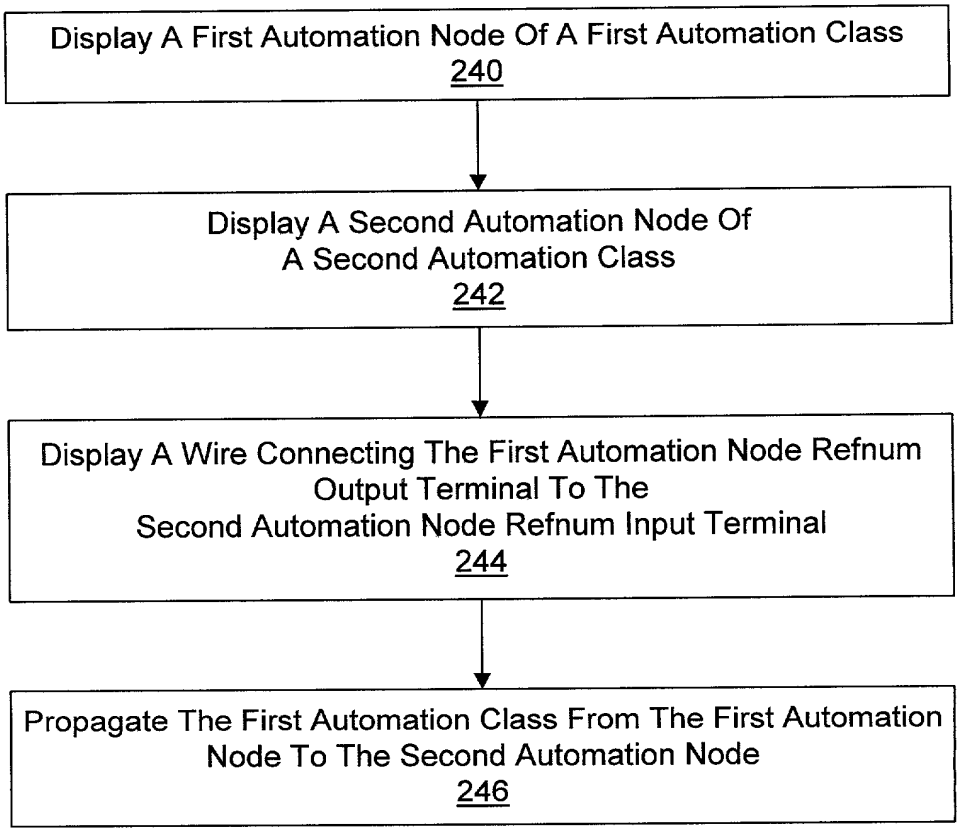
Display A First Automation Node Of A First Automation Class
240
Display A Second Automation Node Of
A Second Automation Class
242
Display A Wire Connecting The First Automation Node Refnum
Output Terminal To The
Second Automation Node Refnum Input Terminal
244
Propagate The First Automation Class From The First Automation
Node To The Second Automation Node
246

FIG. 20

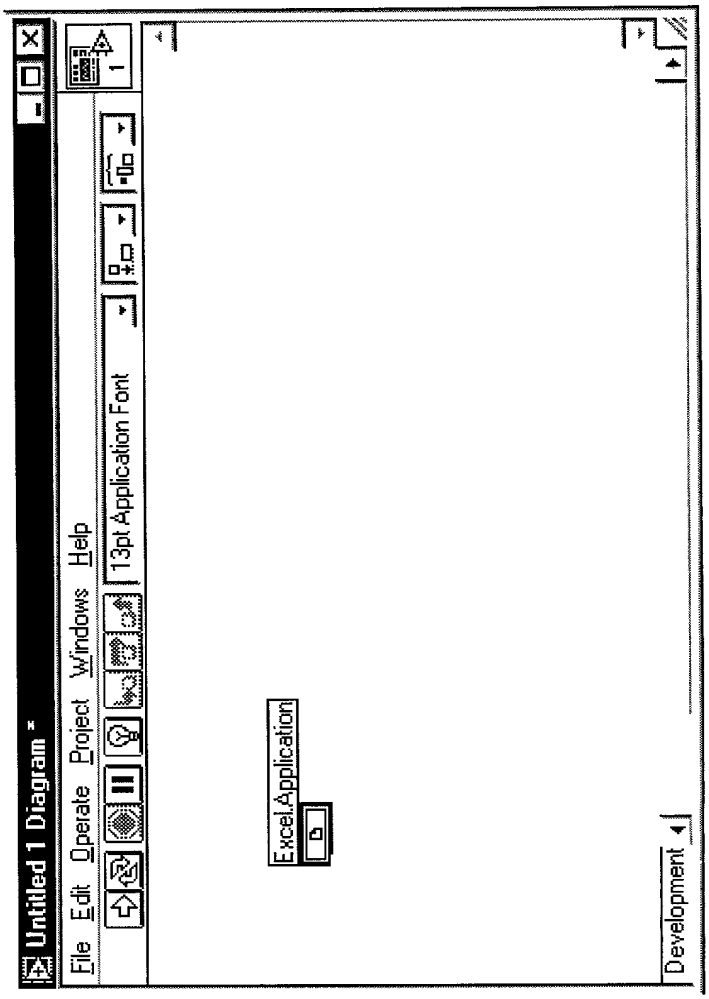
Untitled 1 Diagram *
File Edit Operate Project Windows Help
13pt Application Font
Excel.Application
Development

FIG. 21

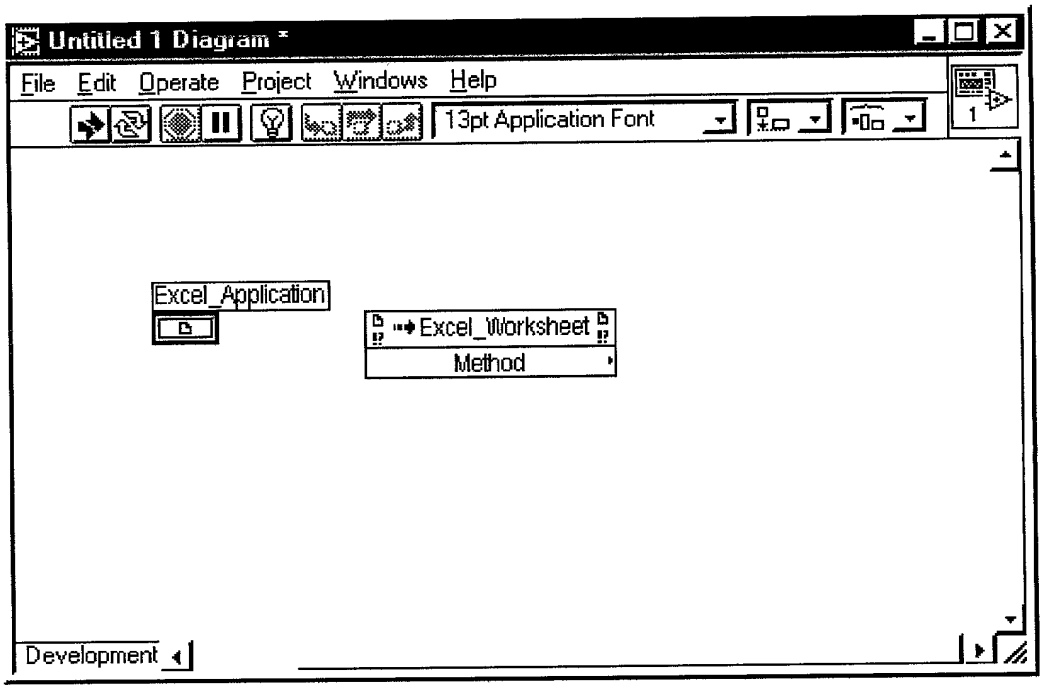
Untitled 1 Diagram *
File Edit Operate Project Windows Help
13pt Application Font
1
Excel_Application
Excel_Worksheet
Method
Development

FIG. 22

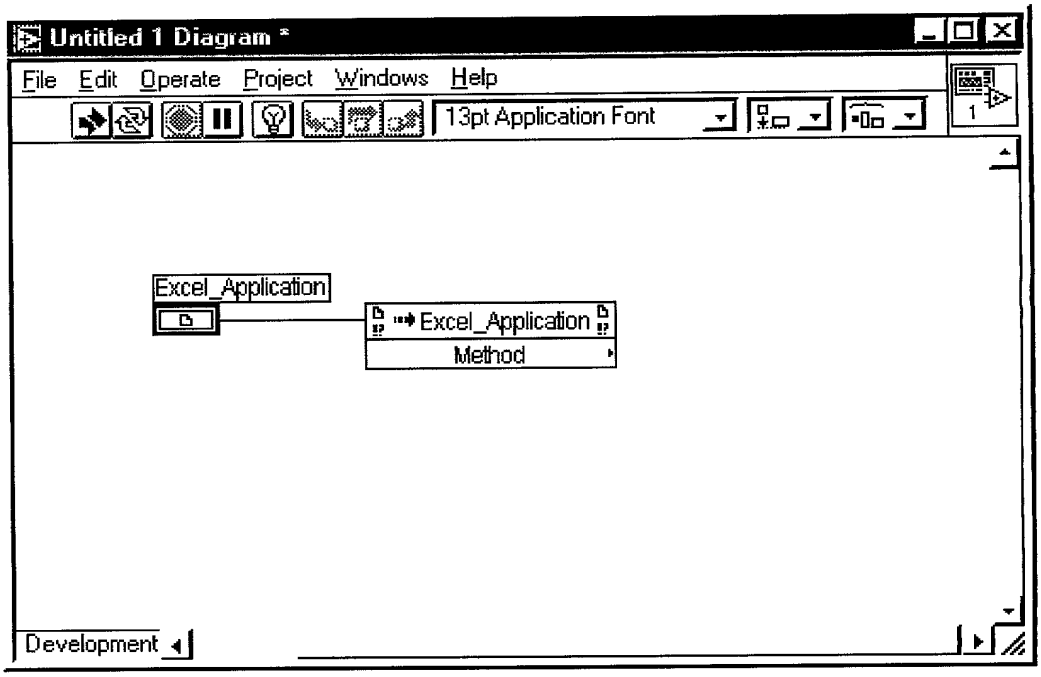
Untitled 1 Diagram *
File Edit Operate Project Windows Help
13pt Application Font
1
Excel_Application
Excel_Application
Method
Development

FIG. 23

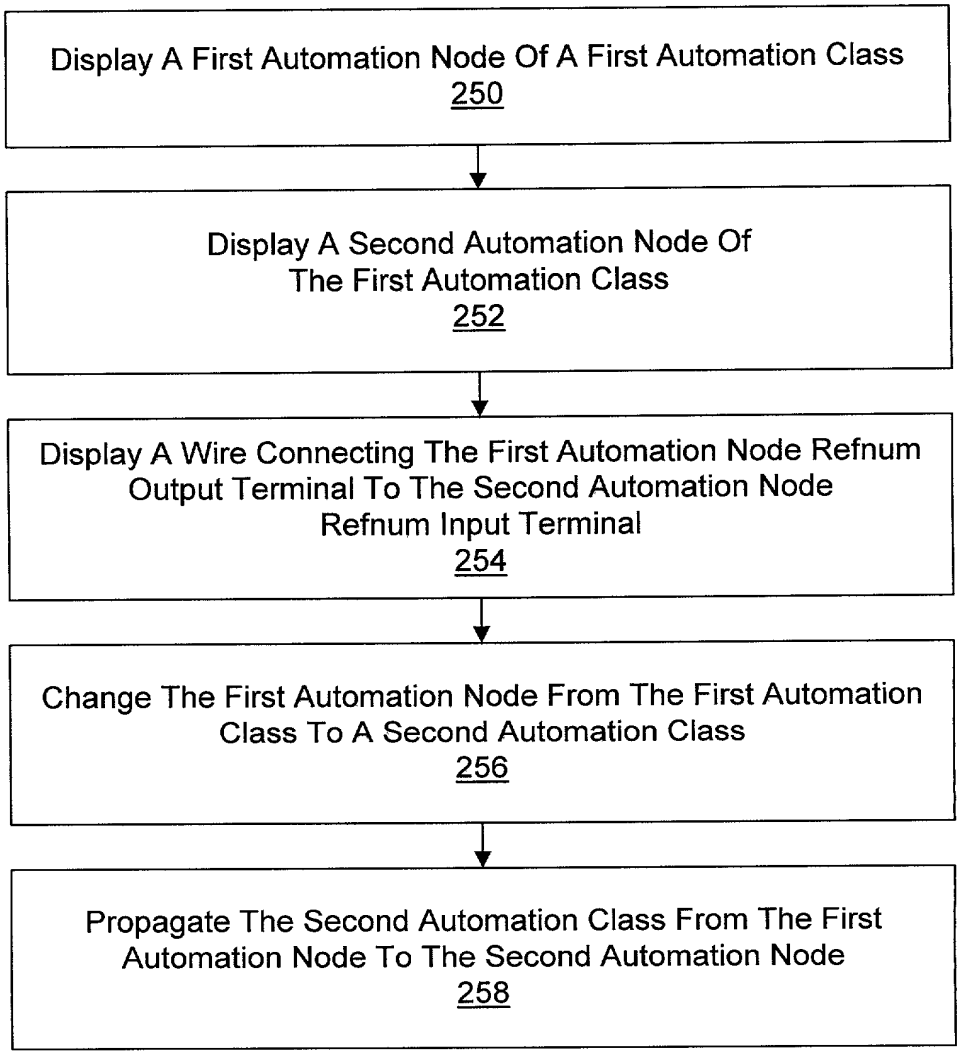
Display A First Automation Node Of A First Automation Class
250
Display A Second Automation Node Of
The First Automation Class
252
Display A Wire Connecting The First Automation Node Refnum
Output Terminal To The Second Automation Node
Refnum Input Terminal
254
Change The First Automation Node From The First Automation
Class To A Second Automation Class
256
Propagate The Second Automation Class From The First
Automation Node To The Second Automation Node
258

FIG. 24

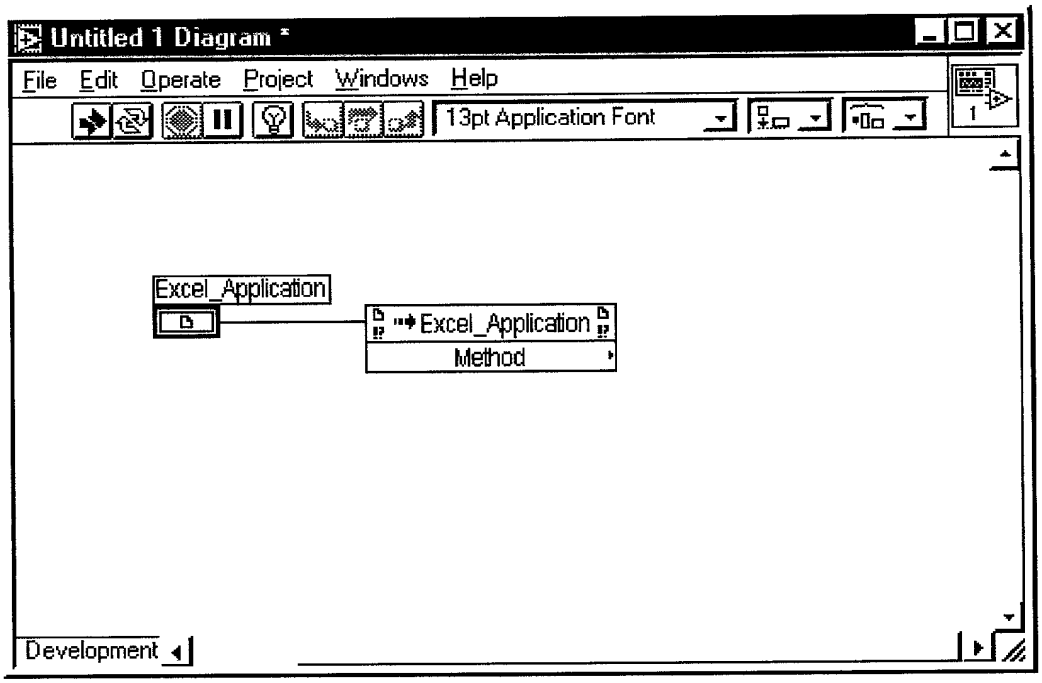
Untitled 1 Diagram *
File Edit Operate Project Windows Help
13pt Application Font
Excel_Application
Excel_Application
Method
Development

FIG. 25

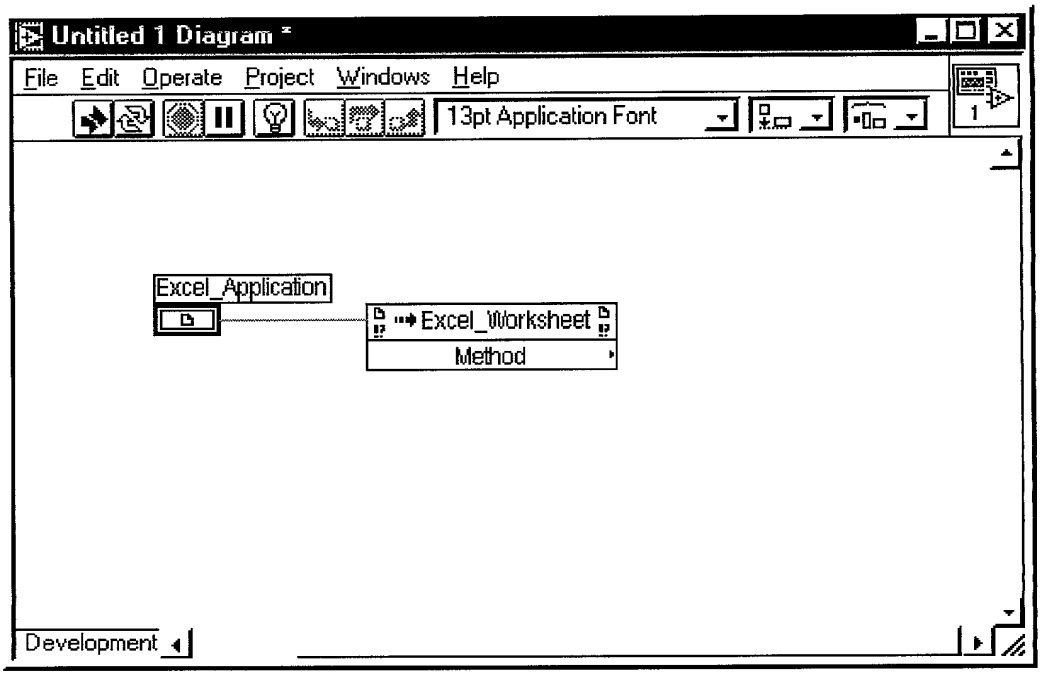
Untitled 1 Diagram *
File Edit Operate Project Windows Help
13pt Application Font
Excel_Application
Excel_Worksheet
Method
Development

FIG. 26

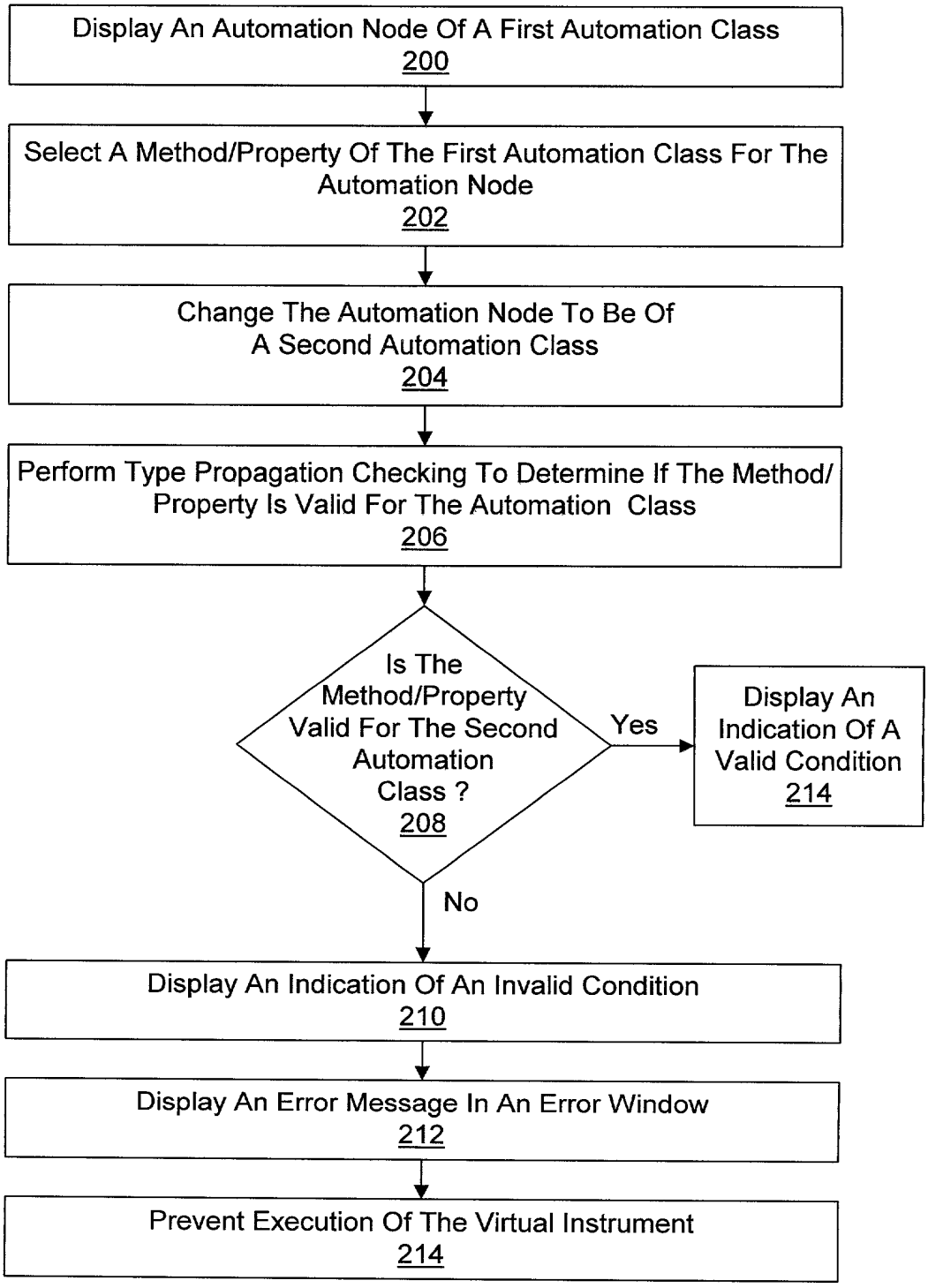
Display An Automation Node Of A First Automation Class
200
Select A Method/Property Of The First Automation Class For The Automation Node
202
Change The Automation Node To Be Of A Second Automation Class
204
Perform Type Propagation Checking To Determine If The Method/ Property Is Valid For The Automation Class
206
Is The Method/Property Valid For The Second Automation Class ?
208
Yes
Display An Indication Of A Valid Condition
214
No
Display An Indication Of An Invalid Condition
210
Display An Error Message In An Error Window
212
Prevent Execution Of The Virtual Instrument
214

FIG. 27

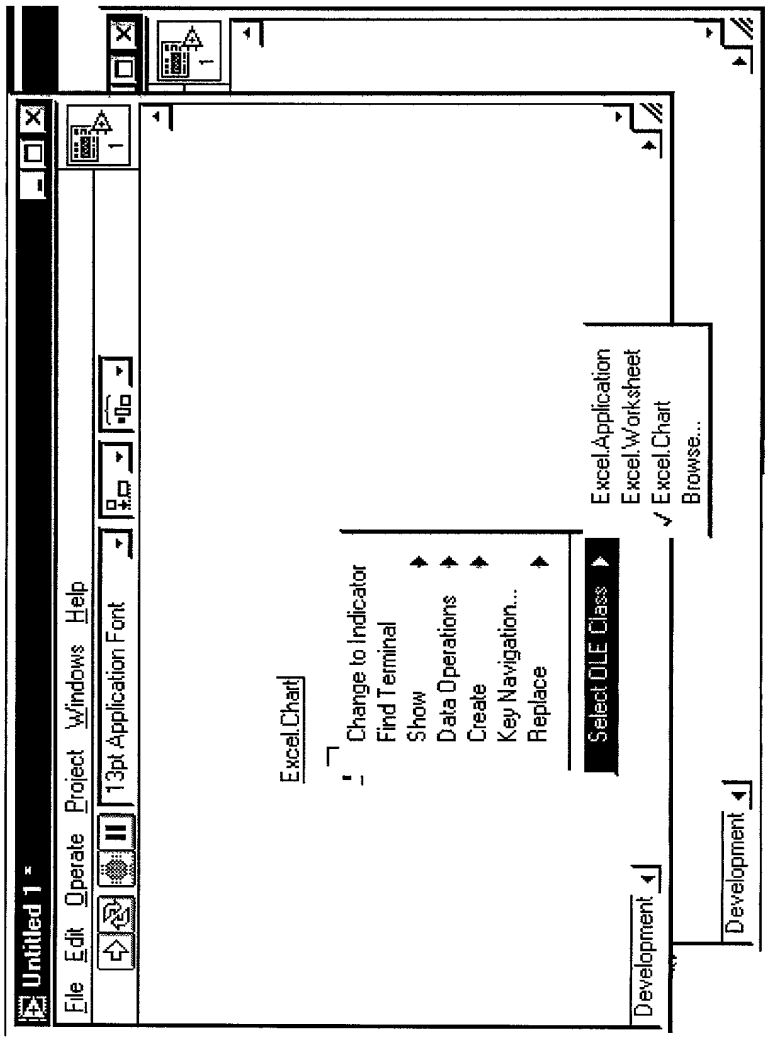
Untitled 1 *
File Edit Operate Project Windows Help
13pt Application Font
Excel.Chart
Change to Indicator
Find Terminal
Show
Data Operations
Create
Key Navigation...
Replace
Select OLE Class
Excel.Application
Excel.Worksheet
✓ Excel.Chart
Browse...
Development
Development

FIG. 28

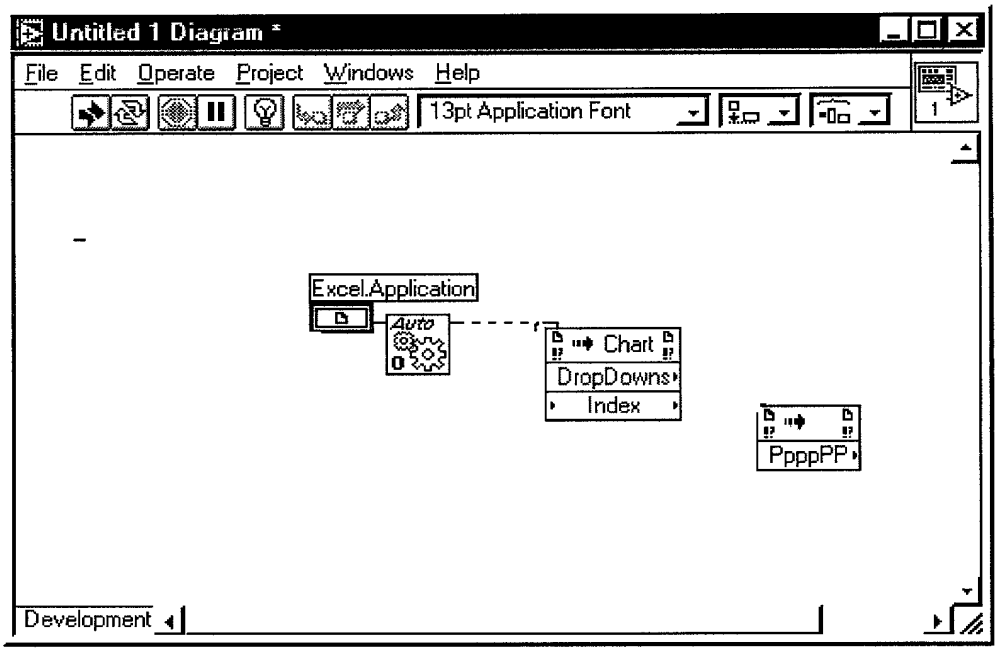
Untitled 1 Diagram *
File Edit Operate Project Windows Help
13pt Application Font
Excel.Application
Auto
Chart
DropDowns
Index
PpppPP
Development

FIG. 29

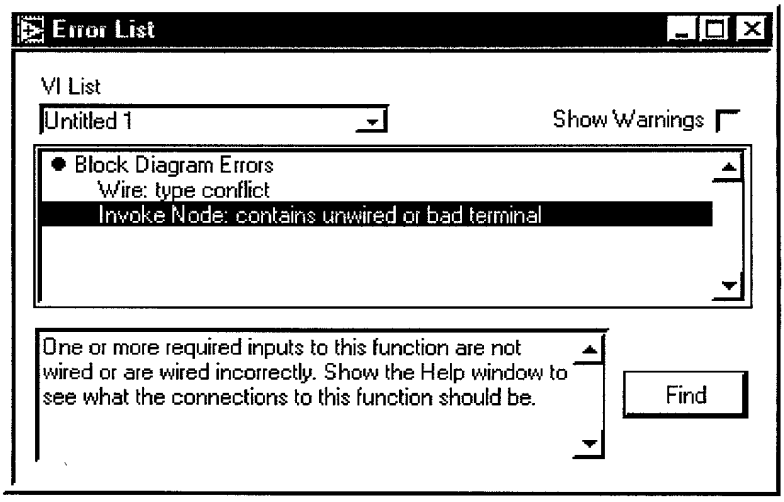
Error List
VI List
Untitled 1
Show Warnings
Block Diagram Errors
Wire: type conflict
Invoke Node: contains unwired or bad terminal
One or more required inputs to this function are not wired or are wired incorrectly. Show the Help window to see what the connections to this function should be.
Find

FIG. 30

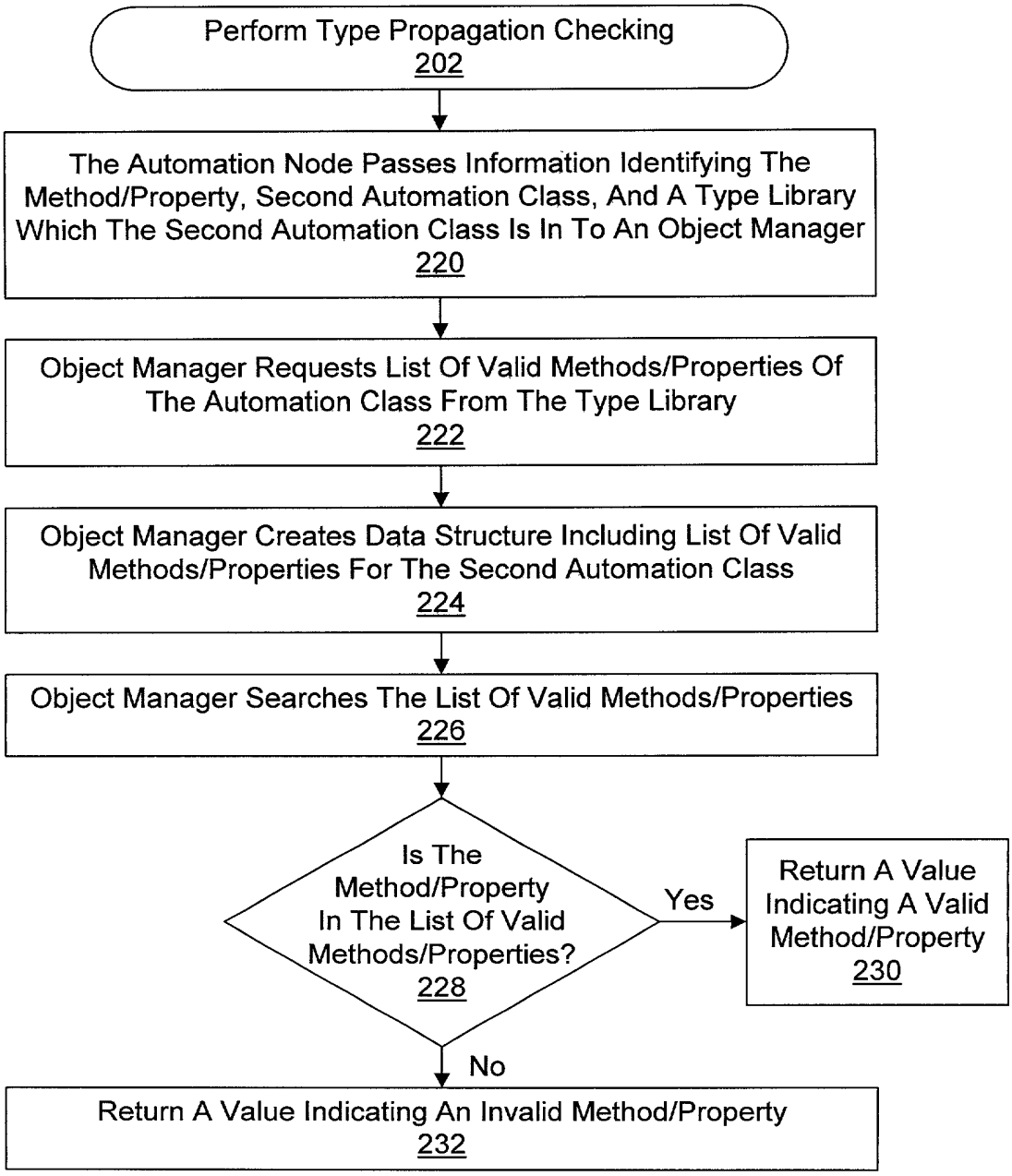
Perform Type Propagation Checking
202
The Automation Node Passes Information Identifying The Method/Property, Second Automation Class, And A Type Library Which The Second Automation Class Is In To An Object Manager
220
Object Manager Requests List Of Valid Methods/Properties Of The Automation Class From The Type Library
222
Object Manager Creates Data Structure Including List Of Valid Methods/Properties For The Second Automation Class
224
Object Manager Searches The List Of Valid Methods/Properties
226
Is The Method/Property In The List Of Valid Methods/Properties?
228
Yes
Return A Value Indicating A Valid Method/Property
230
No
Return A Value Indicating An Invalid Method/Property
232

FIG. 31

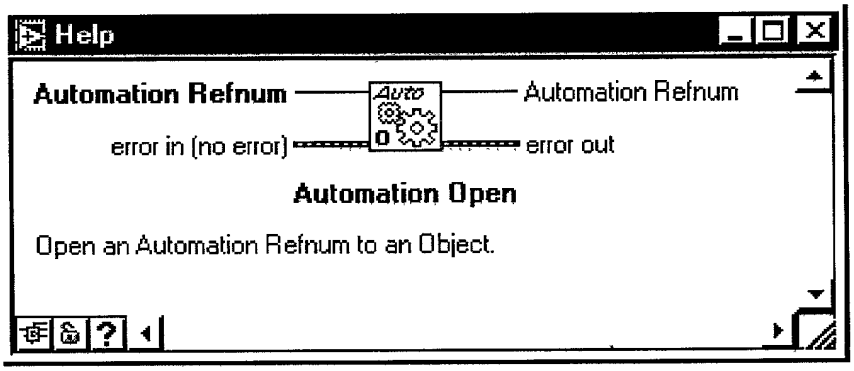

FIG. 32

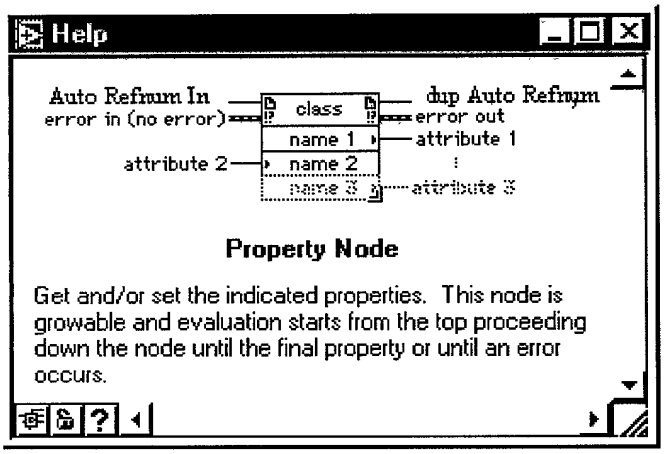

FIG. 33

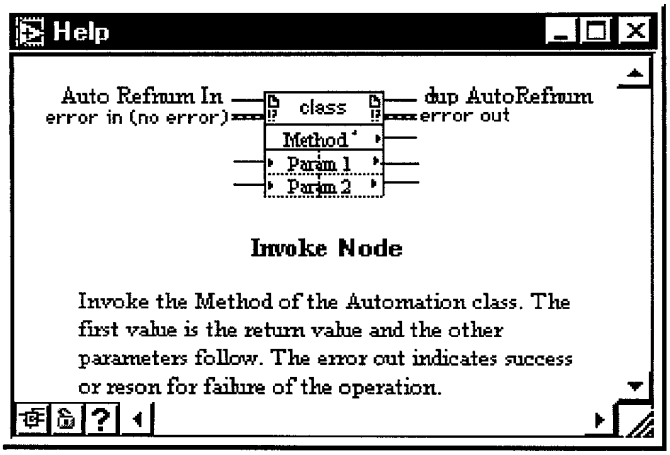

FIG. 34